THE MONOPOLIES COMMISSION

Electric Lamps

Second Report on the Supply of Electric Lamps

Part I

Presented to Parliament in pursuance of section 9 of the Monopolies and Restrictive Practices (Inquiry and Control) Act 1948

Ordered by The House of Commons *to be printed*
2nd December 1968

LONDON
HER MAJESTY'S STATIONERY OFFICE

4 [Not sold separately]

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SBN 10 200469 2

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* These members and Sir Laurence Watkinson, KBE, CB, MC, formed the group, under the chairmanship of Mr. A. H. Bruce, which was responsible for this inquiry. In view of his position as Chairman of the Parliamentary Committee of the Co-operative Union, Mr. L. A. Hurt took no part in the inquiry after 14th August 1966. Sir Laurence Watkinson retired from membership of the commision in March 1968 and took no further part in the inquiry.

† *Note by the Board of Trade.* Mr. Bruce, Mr. Hurt, Dame Alix Meynell, Professor Sayers and Mr. Silberston have ceased to be members of the Commission since the Report was signed.

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The Reference made by the Board of Trade

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Reference to the Monopolies Commission

Electric Lamps

1. Whereas it appears to the Board of Trade that it is or may be the fact that conditions to which the Monopolies and Restrictive Practices (Inquiry and Control) Act 1948 (hereinafter called 'the Act of 1948') as amended by the Restrictive Trade Practices Act 1956 and the Monopolies and Mergers Act 1965 applies prevail as respects the supply of electric lamps of the following descriptions, namely (i) filament lamps exceeding 28 volts (whether for illumination or other purposes); and (ii) discharge lamps and fluorescent lamps (for illumination).

2. Now therefore the Board of Trade in pursuance of section 2 (1) of the Act of 1948 as so amended hereby refer to the Monopolies Commission for investigation and report the supply of lamps of each of those descriptions within the United Kingdom.

3. The Commission shall as respects such supply investigate and report on whether the conditions to which the Act of 1948 as amended as aforesaid applies in fact prevail.

4. The Commission shall, if they find such conditions prevail, also investigate and report whether the said conditions and any things which may be done by the parties concerned as a result of, or for the purposes of preserving, those conditions operate or may be expected to operate against the public interest.

Dated this 8th day of February 1966.

D. R. SERPELL

A Second Secretary of the Board of Trade

Report on the Supply of Electric Lamps

(i) We submit the following report on the supply in the United Kingdom of (i) filament lamps exceeding 28 volts (whether for illumination or other purposes) and (ii) discharge lamps and fluorescent lamps (for illumination) in compliance with section 2 (1) of the Monopolies and Restrictive Practices (Inquiry and Control) Act 1948 (as amended). The reference was received from the Board of Trade on 8th February 1966.

(ii) We have received evidence from British Lighting Industries Ltd. (BLI), Crompton Parkinson Ltd. (Crompton), Osram (GEC) Ltd. (Osram) and Philips Electronic & Associated Industries Ltd. (Philips), the principal suppliers of electric lamps, and from the Electric Lamp Industry Council Ltd. (ELIC).

(iii) We have also received evidence from other manufacturers of electric lamps; from manufacturers of components for electric lamps; from the Ministry of Technology and the British Standards Institution; from the National Coal Board, British Railways Board and other nationalised industries; from many local authorities; from the Electrical Wholesalers' Federation and trade associations representing retail distributors; from individual wholesale and retail distributors and from industrial and commercial users. From some of these witnesses we took oral evidence after we had considered their written submissions. Members of the Commission and of the staff visited certain factories.

(iv) Representatives of BLI attended a meeting in April 1967 to clarify outstanding matters of fact.

(v) In June 1967 we informed BLI, Crompton, Osram and Philips of our provisional conclusions that the conditions to which the 1948 Act (as amended) applies prevailed in respect of the supply of the electric lamps defined in the reference; and we notified each company of the respects in which it might be contended that, so far as it was concerned, the conditions, or the things done as a result of or for the purpose of preserving the conditions, operated or might be expected to operate against the public interest. BLI, Crompton, Osram and Philips made certain representations to us in writing. In December 1967 Philips' representatives attended a hearing for the purpose of discussing these matters with us. BLI and Osram each attended a similar hearing in January 1968. At these meetings BLI, Osram and Philips were represented by Counsel. BLI, Crompton and Osram elected to make joint representations to us in writing in respect of certain matters notified to them and to Philips, individually, as shareholders in a group of companies known as the 'Controlled Companies'. In January 1968 representatives of BLI, Crompton and Osram attended a hearing for the purpose of discussing those particular matters with us. At this meeting they were represented by Counsel.

(vi) In June 1967 we also informed the principal distributors' associations of our provisional conclusions that the conditions prevailed in respect of the supply of electric lamps defined in the reference, and invited their observations upon a number of questions which appeared to us to be relevant to our judgment upon the public interest in this connection. These associations made certain representations to us in writing.

(vii) We wish to record our appreciation of the assistance given to us by BLI, Crompton, Osram and Philips, and all the others who have provided us with the

information required in our investigation. Some of the information relates to confidential business affairs and we have been careful not to disclose it in our report unless it is essential for a proper understanding of the issues.

(viii) For convenience the report is divided into two parts. In the first part, after a short introductory description of the subject matter covered by the reference, we discuss the issues arising and record our conclusions and recommendations. In the second part, we give a more detailed account of the facts and of the evidence submitted by the parties concerned and other witnesses.

A. H. BRUCE (*Chairman*)

A. R. BARROWCLOUGH

ROGER FALK

W. E. JONES

ALIX MEYNELL

AUBREY SILBERSTON

J. M. A. SMITH

MISS M. DENNEHY (*Secretary*)
25th July 1968

CHAPTER 1

Introduction

Description of the goods

1. The electric lamps to which our reference applies are filament lamps exceeding 28 volts (whether for illumination or other purposes) and fluorescent and discharge lamps for illumination. These descriptions cover a large number of different types of lamps designed for a wide range of uses, from the familiar types for domestic, office and street lighting to lamps for specialised applications, including lamps for television studios, cinema projectors, lighthouse lanterns, the lighting of airfield runways and the flood lighting of buildings, sports stadiums and marshalling yards, and lamps for the illumination of traffic signals, switchboards and industrial and domestic appliances. The limitation of filament lamps to those over 28 volts effectively excludes from our inquiry all types of motor vehicle and other battery or dynamo operated lamps, most train lighting lamps, and miners' lamps. The limitation of fluorescent and discharge lamps to those for illumination excludes from our inquiry certain lamps used for advertising, heating, medical applications and other special uses. It has been estimated that including the different finishes, voltages and wattages of individual types, about 4,000 different electric lamps as defined in the reference are available in this country at the present time.

2. In filament lamps, the light is produced by the heating to a high temperature, by the passage of electric current, of fine tungsten wire enclosed in a vacuum or gas filled glass envelope or bulb. The majority of filament lamps are gas filled, usually with a mixture of argon and nitrogen. As well as the familiar pear shape, filament lamps are made in a variety of other shapes including mushroom, candle, tubular and round. The bulb may be made in a number of finishes, including clear, pearl and coloured. The pearl finish reduces glare; it also reduces the light output by about 1 to 2 per cent below that of clear lamps. The bulk of production of filament lamps as defined in the reference consists of the common pear shaped and mushroom shaped lamps, known as General Lighting Service (GLS) lamps, for general domestic, commercial and industrial lighting. The lamps are made in wattages of from 5 to 1,500. At the present time, the heaviest demand is for the 100 watt lamp, whereas some years ago the 60 watt was the most popular. There are two main types of GLS lamps—single-coil and coiled-coil. In the single-coil lamp, the filament is coiled into a tight spiral by being wound round a metal rod or 'mandrel', generally of molybdenum, which is then dissolved out. In the coiled-coil lamp, first introduced in about 1934, the already coiled filament is wound round a second mandrel, resulting in a more compact filament with, when incandescent, correspondingly less loss of heat to the gas. Coiled-coil lamps thus give more light than single-coil lamps; the difference in the light output of the two pear shaped types ranges from 20 per cent at 40 watts to 3 per cent at 100 watts. Coiled-coil lamps are made in the mushroom shape in wattages of 40, 60, 100 and 150. These lamps have an interior white silica coating which diffuses the light; it also reduces the light output by about 8 per cent below that of pear shaped coiled-coil lamps of the same wattages. The rated average life of the bulk of filament lamps is 1,000 hours, which has been general in this country for over 40 years.

3. Basically, the burning life and the light output of a filament lamp are determined by the operating temperature of the filament and this in turn is determined by the construction, thickness and length of the filament; generally, the higher the temperature, the shorter the life. Some GLS lamps are produced with thicker and longer filaments than those used for 1,000-hour lamps; these run at a lower temperature and have nominal burning lives of 2,000 or 2,500 hours but they give less light than the standard pear shaped 1,000-hour lamps of the same wattage, though the actual differences in light output vary with the different specifications. There is no British Standard for long life filament lamps, but a specification for 2,500-hour lamps, IEC 64A, is published by the International Electrotechnical Commission (IEC).* A long life filament lamp developed here in the early 1960's jointly by a nationalised industry and a lamp manufacturer has a rated average life of 2,000 hours and a light output which is, to the ordinary eye, indistinguishable from that of the standard 1,000-hour pear shaped lamp. This and other makes of long life GLS lamps are dealt with in detail in the second part of the report. The manufacturers who make long life GLS lamps supply them almost entirely to large users, particularly for use where frequent lamp changing is inconvenient or labour costs high. None of the lamps is available through the ordinary channels of distribution to the general public. The initial light outputs required by the specifications for the main types of filament lamps mentioned in this and the preceding paragraph are shown in appendix 8, table 7.

4. In fluorescent lamps, the light is produced by the excitation of a uniform inner coating of fluorescent powder or 'phosphor' by exposure to ultraviolet radiation produced by an electric discharge passing through low pressure mercury vapour in a glass envelope. The electric discharge takes place between two electrodes consisting of tungsten filaments coated with thermionic emissive material. These lamps need to be operated in conjunction with auxiliary electrical equipment, known as chokes or ballasts, to limit the lamp current to the design value. A 'starter' switch or special circuit is needed to preheat the electrodes and initiate the discharge. The main range of lamps is made in wattages of from 15 to 125; the lamps are generally in the form of straight tubes in lengths of from 18 inches to 8 ft and diameters of 1 to $1\frac{1}{2}$ inches, but are also produced in short $\frac{5}{8}$-inch diameter tubes and in circular form. The nominal life of most fluorescent lamps is 7,500 hours. They are commonly white, 'warm white' or 'daylight' in colour, but are also available in other colours. The manufacturers have told us that the main growth in lamp sales is in fluorescent lamps, and that in industry and commerce the filament lamp has been 'relegated to a secondary role'. They have also told us that the rated average lives of fluorescent lamps, and of sodium and mercury discharge lamps, have been increased substantially since 1951, as has their luminous efficiency.

5. Discharge lamps depend for the production of light on electric discharge in gases and metallic vapours; they were developed in the 1930's and the first type to be available commercially was the low pressure sodium vapour lamp. In the years following the end of the last war, this type came into widespread use for street lighting. The lamp emits a bright yellow light; it is highly efficient but its colour makes it unsuitable for indoor use. Sodium lamps have an average life of 6,000 hours; they are made in a number of types ranging in wattage from 40

*Available from the British Standards Institution, Newton House, Pentonville Road, London, N.1. Price 8s.

to 200. They consist basically of an inner tube in which the electrical discharge takes place, and an outer bowl or jacket. In some types of sodium lamps these parts are integral, in others the lamps and jackets are available separately. A later development was the high pressure mercury vapour lamp. These lamps also consist of an arc tube surrounded by an outer bulb. They are used for street lighting and to some extent for industrial uses, such as in yards and in high bays in factories. They emit a bluish-green light, but suitable choices of fluorescent powders deposited on the inside of the bulb or the tube can to some extent modify the colour. The lamps are made in wattages of from 50 to 2,000, depending on type, with a rated average life of 7,500 hours. Discharge lamps are made in a variety of shapes for different lighting applications. All discharge lamps require separate ballasts, generally known as 'control gear', to control the current flowing through the circuit and activate the electrical discharge; and different control gear is required for the different types of these lamps. One type of discharge lamp is a blend of tungsten filament and mercury discharge in which a tungsten filament functions as a ballast and also gives some light immediately on switching on. The principal components used in the manufacture of reference lamps are the outer glass envelopes in the form of bulbs or tubes, glass tubing and rod for interior components, different types of wire, metal caps, fluorescent powders and chemicals and various gases. A short account of the manufacture of each of the descriptions of reference lamps is given in appendix 6 and the current retail prices of some popular types are given in appendix 8, table 1.

Developments in reference lamps

6. The principal manufacturers have told us that the bulk of their GLS tungsten filament lamps are made to a higher nominal light output than the minimum specified in the relevant British Standard and have longer burning lives than the rated average. They also said that to obtain higher lighting standards and longer life with tungsten filament lamps creates serious heat problems. Any increases in both light output and life could be achieved only by increasing the wattage i.e. power dissipation which, in turn, would create heat problems with the small fittings used for GLS lamps. They indicated that the limit had almost been reached in this respect, and no new developments in the classical tungsten filament lamp field were foreseen. However, the development of the tungsten halogen lamp (also referred to as 'tungsten-iodine' or 'quartz-iodine') had opened up a completely new field. These lamps are already in use for photographic projection and floodlighting and for motor vehicles; and we are told they are also being developed for other applications. In the case of fluorescent lamps, the development of new types of braided cathodes, tubes with dual wattage and voltage ratings and improvements in the blending of phosphor powders have resulted in an increase in life, light output, easier starting and better colour rendering. The manufacturers emphasised that both the light output and life of fluorescent lamps have increased substantially since 1951 and they claimed that the rated average life of 7,500 hours of many fluorescent lamps is, in fact, generally exceeded. In the case of mercury and sodium discharge lamps also, there have been a number of important developments. These resulted in the marketing of a low pressure sodium lamp which gives a better light output for a lower wattage. By way of example, the manufacturers compared the 140-watt sodium lamp, which in 1939 had a light output of 10,000 lumens* and had a life of 2,500 hours, with the current 90-watt sodium lamp

*The lumen is the unit of luminous flux used in BSI and other specifications.

which has a light output of 12,500 lumens and a life of 6,000 hours; this represents a 25 per cent increase in light output, a reduction in consumption of 50 watts and more than double the life. Each of the three principal manufacturers also told us about their respective developments of a high pressure sodium discharge lamp which is said to give a warm white light likely to be acceptable for interior installations where the yellow light of the low pressure lamp is unsuitable. Similarly, since pre-war, improved designs in mercury discharge lamps have produced similar striking comparisons. One manufacturer compared the 400-watt mercury discharge lamp, which in 1939 had a light output of 18,000 lumens and had a life of 1,500 hours, with the current lamp of the same wattage which has a light output of 20,500 lumens and a life of 5,000 hours; this represents an increase in light output of 14 per cent and more than treble the life.

The manufacturers

7. The following are the principal manufacturers of reference lamps:
British Lighting Industries Ltd. (BLI), the leading manufacturer, was formed in 1964 to acquire the lamp and lighting interests at home and abroad of Thorn Electrical Industries Ltd. (Thorn) and Associated Electrical Industries Ltd. (AEI). Until October 1967 it was owned as to 65 per cent by Thorn and 35 per cent by AEI, and effective management and control rested with Thorn. On 20th October 1967, Thorn acquired AEI's interest in the company, which is now a wholly owned subsidiary of Thorn. BLI sells three main brands of lamps, Mazda (the AEI brand), Atlas and Ekco. It also sells a limited range of cheaper lamps under second brand names, and also lamps marked with brand names required by certain buyers such as other manufacturers, nationalised industries, electricity boards, chain stores, etc.

Philips Electronic & Associated Industries Ltd. (Philips) is owned by NV Philips Gloeilampenfabrieken, Holland (NV Philips). It owns or controls a number of companies concerned with the manufacture and supply of reference lamps. Included in the group is a wholly owned subsidiary, Philips Electrical Ltd., and Luxram Electric Ltd. (Luxram) and The Kingston Lamp Co. Ltd. (Kingston) in which Philips acquired controlling interests in 1965 and 1966, respectively. Philips sells two main brands of lamps, Philips and Stella. The group also sells cheaper lamps under second brand names and lamps marked with buyers' own brands.

Osram (GEC) Ltd. (Osram) was formed in 1961 to manage the lamp division of The General Electric Co. Ltd. (GEC) and to market its products, and also to manage GEC's other lamp and lighting interests at home and some of its lamp and lighting interests abroad. In 1965 GEC acquired Ascot Lamps and Lighting Ltd. (Ascot). Osram sells two main brands of lamps, Osram and Elasta. It also sells cheaper lamps under the Ascot brand name and lamps marked with buyers' own brands.

Crompton Parkinson Ltd. (Crompton) sells one main brand of lamp and one cheaper second brand; it also sells buyers' own brands. In February 1967 Hawker Siddeley Ltd. acquired the whole of the equity in Crompton; Crompton continues to trade under its own name.

8. Each of the four principal manufacturers produces lamps of all the descriptions covered by the reference; each makes a range of different types of each

description except Crompton, which makes only one type of discharge lamp. With the exception of lamps developed for certain specialised applications, the ranges of the standard types of reference lamps offered for sale by these four manufacturers in their respective main brands are virtually identical. Substantial inter-trading between manufacturers is a long standing practice in the lamps industry. Some of the inter-trading covers lamps which individual manufacturers prefer, for one reason or another, not to make themselves but which they wish to include in their ranges to match the ranges offered by their competitors; other inter-trading covers lamps required by individual manufacturers from time to time to supplement their own production. The brand names required by the buyer are etched on the lamps by the seller in the course of manufacture, and the seller generally packs the lamps in branded 'sleeves' and cartons supplied by the buyer.

9. The smaller manufacturers include the '*Controlled Companies*', a group of companies owned in varying proportions by BLI, Philips, GEC and Crompton. They are Ismay Lamp Works Ltd., Britannia Electric Lamp Works Ltd., Splendor Lamp Co. Ltd., Evenlite Tube Lamp Developments Ltd. and MSL Ltd. (which is not concerned with reference lamps). Ismay, Britannia and Splendor have recently been reorganised. Ismay is now the principal company in the group and production is concentrated at its factory; Britannia, now a subsidiary of Ismay, sells a simplified range of GLS and other filament lamps, mainly to Woolworth. Splendor is now a selling company only. A substantial proportion of the companies' sales requirements of reference lamps is now obtained from the shareholders. Another smaller manufacturer, *British Luma Co-operative Electric Lamp Society Ltd.* (British Luma)* is owned, in equal proportions, by the Co-operative Wholesale Society Ltd., the Scottish Co-operative Wholesale Society Ltd. and the Ko-operativa Forbundet, Sweden. British Luma manufactures a simplified range of GLS filament lamps almost entirely for supply to co-operative wholesale societies for retail sale in co-operative retail societies' stores. *British Electric Lamps Ltd.* (BELL), a small private company, manufactures a range of decorative filament lamps, including candle and architectural lamps. Of the other smaller manufacturers, only *J. F. Poynter Ltd.*, trading as Maxim Lamp Works, makes GLS lamps; the others are specialist manufacturers of other types of filament lamps such as strip and architectural types, or of fluorescent lamps. The organisation, production and trading arrangements of the principal manufacturers are dealt with in chapter 5 as are brief details of the arrangements of the smaller manufacturers apart from the Controlled Companies which are dealt with in chapter 6.

10. The table below shows the total sales of reference lamps by the manufacturers and importers in recent years, by net sales value:

	1965	**1966**	**1967**
	(£'000)	(£'000)	(£'000)
BLI	10,200	10,762	10,403
Philips	4,724	5,987†	6,233†
Osram	4,967	4,969	5,230
Crompton	1,334	1,617	1,697
Controlled Companies	1,067	792	965
Others	1,610†	991	888
Total	23,902	25,118	25,416

*See footnote to paragraph 327.
†Includes sales by Luxram and Kingston (see paragraph 7).

Reference lamps imported by the principal manufacturers are included in the above figures for each, and account for practically all imports of reference lamps.

Components manufacturers

11. The principal components for reference lamps mentioned in paragraph 5 are made by four companies, formerly owned jointly by AEI and GEC and now owned jointly by BLI and GEC; these are Glass Bulbs Ltd., Glass Tubes and Components Ltd. (GTC), Lamp Caps Ltd. and Lamp Metals Ltd. These companies sell their products to their parent companies and also to other lamp manufacturers. Glass Bulbs is the sole supplier in this country of the common types of glass bulbs for filament lamps. GTC and Chance Bros. Ltd., a subsidiary of Pilkington Bros. Ltd., make tubing for fluorescent lamps and glass tubing and rod which they sell to the lamps industry generally. BLI's subsidiary, Lamp Presscaps Ltd., makes the 'bi-pin' type of cap for fluorescent tubes; its interest in the vitrited type of cap used for filament and discharge lamps was sold to Lamp Caps in 1967, and Lamp Caps is now the sole supplier of this type in this country. Lamp Metals and Philips' subsidiary, Mullard Ltd., make and sell a variety of types of wire and coiled filaments.

Manufacturers' trade associations

12. The principal trade association of lamp manufacturers which existed from 1933 until 1957 was the Electric Lamp Manufacturers' Association (ELMA). ELMA operated a number of arrangements, including common maintained prices and discounts, collective sanctions and exclusive dealing; its members were parties to international agreements which included market and patent sharing arrangements. In 1949 the supply of electric lamps of virtually all types,* including those for motor vehicles, was referred to the then Monopolies and Restrictive Practices Commission. The Commission's report of 1951† dealt primarily with the activities of ELMA, whose members at that time were AEI, GEC, Philips, Crompton and BELL, directly or through subsidiaries, together with Siemens Bros. & Co. Ltd. (a company which was subsequently acquired by AEI), and a small company, Aurora Lamps Ltd., which has since been wound up. Thorn was at that time the largest of the independent manufacturers outside ELMA. The Commission's findings and recommendations are summarised in paragraph 165, following a brief account of the industry up to 1951. Certain of the ELMA and other arrangements mentioned above then terminated, but common prices and discounts were continued until the coming into force of the Restrictive Trade Practices Act in 1956; shortly after this, ELMA was dissolved. In 1957 the Electric Lamp Industry Council (ELIC) was formed; its membership consisted of the former members of ELMA, Philips (which had resigned from ELMA in 1955), Thorn and Ekco-Ensign Ltd. (Ekco) in which Thorn had a controlling interest. The members continued to maintain their respective resale prices of their main brands, but they no longer did so collectively; neither did they fix lamp prices collectively, although their prices nevertheless remained substantially the same. ELIC threw up a Discount Structure which recommended discounts for

*The reference applied to (a) electrical filament lamps, for illumination or otherwise; and (b) discharge lamps and fluorescent lamps for illumination.
†Monopolies and Restrictive Practices Commission. *Report on the Supply of Electric Lamps.* Sess. 1950–51, HC 287. HMSO 6s. 0d.

main brands of lamps which were broadly equivalent to the ELMA discounts and quantity rebates. Buyers were classified according to their total purchases of all brands from all sources or, in the case of local authorities, by types and populations. The structure was registered with the Registrar of Restrictive Trading Agreements, but was abandoned at the end of 1959. In January 1960 ELIC adopted a Discount Schedule which differed from the 1957 structure in that although it defined classes of buyers it did not recommend any rates of discounts, which were the prerogative of each individual member. In 1961 ELIC was dissolved and the Electric Lamp Industry Council Ltd. (ELIC Ltd.), which had been formed for another purpose, took over the activities formerly carried out by ELIC. Further details of the activities of ELIC and ELIC Ltd. are in chapter 4. For convenience, throughout the rest of this report we refer to both ELIC and ELIC Ltd. as 'ELIC', except where it is necessary to differentiate between the two bodies.

13. As from 1st April 1967 the members of ELIC abandoned resale price maintenance in respect of their main brands of lamps; their respective prices and discounts have since been recommended or, in one case, published for guidance, and until March 1968 were virtually identical between the members. The recommended (or published) retail list prices remain virtually identical, type for type, but discounts now vary. (Resale price maintenance has never been applied to the principal manufacturers' second brands or to the products of the smaller manufacturers.)

Distribution

14. The market for reference lamps can be said to fall into three main sectors. The first covers the traditional channel of distribution of electrical consumer goods, through electrical wholesalers to electrical retailers and contractors and commercial and industrial users; the great bulk of sales to this sector consists of the principal manufacturers' main brands, primarily of filament and fluorescent lamps but including a proportion of discharge lamps. The second sector covers sales, mainly direct by manufacturers but also through wholesalers, to large users including government departments, nationalised industries, local authorities and the larger commercial and industrial undertakings; the lamps supplied to this sector are of all the descriptions defined in the reference and include the principal manufacturers' main brands and their cheaper second brands, and also the products of the Controlled Companies and of one or two small manufacturers. The third, which may be termed 'the cheap lamp sector', covers sales, mainly of a simplified range of GLS lamps, by the principal manufacturers of their second brands, and by the Controlled Companies, to electricity area boards, chain stores, supermarkets and the like, and to some industrial and commercial users. These lamps are supplied by the manufacturers at lower net prices or at higher discounts off list prices than those which apply to main brands; and most are retailed at lower prices than main brands. It is only in recent years that the principal manufacturers have participated directly in this sector; formerly, with one minor exception, they did so only indirectly through their interests in the Controlled Companies.

Distributors' trade associations

15. Trade associations concerned with the distribution of reference lamps are the Electrical Wholesalers' Federation (EWF), whose members distribute a

substantial proportion of total supplies of the main brands; The NECTA Ltd. (The National Electrical Contractors' Trading Association); The National Federation of Ironmongers (NFI); and The Radio and Television Retailers' Association (RTRA) Ltd. Details of these associations' activities in connection with the distribution of electric lamps are in chapter 8.

Electricity supply

16. The standard consumer voltage of 240 volts AC is now available in most parts of the United Kingdom and 95 per cent of consumers are supplied at this voltage; the bulk of production of electric lamps is, accordingly, rated at 240 volts. The number of places where non-standard voltages of from 200 to 230 and 250 are still in operation is steadily decreasing. For a few establishments, including certain hospitals, factories and farms, transformers owned by the consumers or by area boards convert supply to meet special requirements. For such establishments and for the places where supply is still at non-standard voltages, lamps of the appropriate voltage ratings are available. Although only 0·03 per cent* of consumers are connected to supply at 250 volts, there is a substantial demand for GLS lamps rated at 250 volts. Some users of these lamps have told us that they buy them to 'under-run'† on standard (or other) voltage supply to obviate the deleterious effects of variations in voltage supply which are said to cause lamps to fail prematurely. Other users of the lamps buy them to under-run simply to obtain longer life, although at the expense of the light output of the lamps. One large manufacturer told us that if a 250-volt lamp is under-run on 240-voltage supply 'the light output will be reduced by 12 per cent‡ and the average life of the lamp raised from 1,000 to 1,750 hours; but the cost to the domestic user per unit of light per unit of time will be increased by 3·6 per cent'. The Electricity Council has said that:

> it is very doubtful whether voltage variations experienced by consumers connected to the 240-volts public supply system are such as to justify the purchase of 250-volt lamps and it is most unlikely that they would be advised by an Area Board to do so. However, on a 240-volt system a 250-volt lamp will probably last longer than a 240-volt one, but at the expense of lighting efficiency because this is a characteristic of under-running electric lamps. The consumer may be conscious of the long life but not of the lesser efficiency and thus create a market for these higher voltage lamps, and it is for debate whether he gains anything overall or not.

British Standards

17. The British Standards Institution (BSI) publishes a number of British Standards relating to different types of reference lamps; the specifications include, inter alia, dimensions and mechanical tests, voltage and wattage tolerances, nominal light output and life performance. The Standards also set out requirements and conditions of test for rating and for life. Other British Standards relate to components for reference lamps and auxiliary equipment for fluorescent and discharge lamps. The Standards are prepared by the Illumination Industry Standards Committee of BSI which includes representatives of government departments, nationalised industries, the National Physical Laboratory, ELIC

*By the end of 1968 there will be no consumers connected to supply at 250 volts.
†Operating a lamp at a lower voltage than that for which it is designed is generally termed 'under-running'. Theoretically, under-running (at constant voltage) by 10 volts gives an 80 per cent increase in life and a 15 per cent reduction in light output. In practice, surges and fluctuations in current will modify these results, as they also modify the performance of lamps run on the voltages for which they are designed.
‡The consumption of electricity (i.e. the wattage) is reduced by about 6 per cent.

and the Association of Public Lighting Engineers. BSI Licences* are held by the principal manufacturers, by certain of their subsidiaries and by British Luma.

Legislation and government policy

18. The electric lamp industry falls within the responsibilities of the Ministry of Technology to which it was transferred from the Board of Trade in 1966. The Ministry has told us that its general aim is to promote efficiency within the industry and to improve its international competitiveness, and that it is prepared to assist the industry by supporting research and development and also to arrange for the interchange of technical information between the industry and the Ministry's own research organisations and university laboratories. So far, the industry has not sought direct assistance although there have been discussions on an advanced lighting technique.

19. Filament lamps not exceeding 250 watts and fluorescent lamps not exceeding 80 watts are subject to purchase tax. The former tax of 25 per cent, based on the statutory wholesale value (which includes any duty payable), bore a temporary surcharge of 10 per cent of the tax from July 1966 until April 1967 when the surcharge was withdrawn and the tax itself increased to the same total of 27½ per cent. Since 20th March 1968 the tax has been 33⅓ per cent. All types of sodium and mercury discharge lamps are exempt from purchase tax.

20. Imports of electric lamps and certain components from Commonwealth and EFTA countries are free of duty. The rates of duty applicable to imports from other countries are as follows:

	Ad valorem	
	Up to 30th June 1968 (%)	From 1st July 1968 (%)
Filament lamps and filaments	16	12½
Discharge lamps including fluorescent	25	20
Lamp caps:		
for filament lamps	16	12½
for discharge lamps	25	20
Tungsten wire, in the length	25	20
Glass envelopes (including bulbs and tubes for lamps):		
for filament lamps	10	8
for other lamps	25	20

With the exception of tungsten wire in the length, all the above goods were liable to the temporary charge on imports for a limited period. This began on 27th October 1964 at the rate of 15 per cent *ad valorem;* on 27th April 1965 the charge was reduced to 10 per cent *ad valorem* and was withdrawn on 30th November 1966. Consequent on the Kennedy round of tariff negotiations under the General Agreement on Tariffs and Trade the rates effective until 30th June 1968 were to be reduced by a half over a period of four years. The first reduction was by two-fifths of the difference on 1st July 1968; further reductions will be by one-fifth on 1st

*The British Standards Mark (popularly referred to as the 'Kite' mark) is a registered certification trade mark owned by the BSI, which may by licence permit manufacturers to use the mark on their products when their quality control arrangements are considered satisfactory and they have agreed to comply with a Scheme of Supervision and Control involving a routine of inspection, sampling and testing appropriate to the particular product. The mark is thus an independent assurance to the purchaser that these products are produced and tested in accordance with the requirements of the relevant British Standard.

January 1970; one-fifth on 1st January 1971; and one-fifth on 1st January 1972. Import licences are required only for imports from Rhodesia, Eastern Europe and China.

Research and development

21. No centralised research facilities are operated by the electric lamps industry in the United Kingdom. In part, this is the result of patent and know-how arrangements which individual manufacturers have had and have with overseas companies.

CHAPTER 2

Issues, Conclusions and Recommendations

Structure of the industry: monopoly conditions

22. We are required by paragraph 3 of the reference to investigate and report whether the conditions to which the Act of 1948, as amended, applies in fact prevail in respect of the supply within the United Kingdom of electric lamps of the following descriptions, namely (i) filament lamps exceeding 28 volts (whether for illumination or other purposes) and (ii) discharge lamps and fluorescent lamps (for illumination). Under the Act the conditions are deemed to prevail if at least one-third of all the goods in question which are supplied in the United Kingdom are supplied by or to (a) one person or two or more inter-connected bodies corporate, or (b) two or more persons who (other than by an agreement which is required to be registered with the Registrar of Restrictive Trading Agreements) so conduct their respective affairs as in any way to prevent or restrict competition in connection with the production or supply of goods of the description in question (whether or not they themselves are affected by the competition and whether the competition is between persons interested as suppliers or producers or between persons interested as customers of suppliers or producers).

23. The total supply in the United Kingdom of electric lamps of the types covered by the reference in 1966 and 1967 was divided among suppliers in the proportions shown in the following table. These proportions represent the net sales value of the lamps supplied and they relate only to the lamps which each supplier had either manufactured or imported; that is to say, lamps made by one manufacturer and sold to a second manufacturer for resale are included in the first manufacturer's shares and not in that of the second manufacturer.* Imports made other than by lamp manufacturers are negligible.

	1966			1967		
	Filament %	Discharge %	Total %	Filament %	Discharge %	Total %
BLI	41	45	43	39	44	41
Philips	20	30	24	20	31	24
of which,						
Luxram	3	—	2	3	—	2
Kingston	2	—	1	2	—	1
Osram	22	16	20	23	17	21
Crompton Parkinson	7	6	6	8	6	7
Controlled Companies	5	—	3	6	—	4
Others (including BELL)	5	3	4	4	2	3

*Except in the case of Philips, whose figures include small quantities of lamps purchased from other United Kingdom manufacturers (see paragraph 280).

24. It is apparent that in these two years BLI was responsible for over one-third of the supply of lamps of each of the descriptions referred to us and also of the supply of lamps of both of those descriptions taken together. No other supplier has supplied as much as one-third of the supply of lamps of either description. We therefore conclude that the conditions to which the Act applies prevail as respects the supply of the lamps covered by the reference because at least one-third by value is supplied by BLI.

25. The effect on the public interest of the monopoly position of BLI, and therefore of the merger of the lamp and lighting interests of AEI and Thorn which brought it about, is an important issue and it is considered in paragraphs 113–145. However, although BLI now has the largest share of the market, Osram and Philips are also powerful companies and the dominance of BLI is far from overwhelming. Indeed, in mercury and sodium discharge lamps alone, apart from other discharge (i.e. fluorescent) lamps, Philips has almost half the trade and BLI has less than one-third (although the terms of our reference did not permit us to find that the conditions to which the Act applies prevailed in respect of these lamps separately). Apart from BLI's statutory monopoly, therefore, the industry is characterised by oligopoly, and in our inquiry we have been concerned to examine whether, as a result, competition is in any way restricted and, if so, what effect that has on the public interest.

26. In this examination we have had in mind that in the past competition in the electric lamps industry was extensively restricted, and we have sought to discover whether the removal of former restrictions has in fact made the industry more competitive.

Changes in the industry since 1951

27. As shown in chapter 3, electric lamps manufacture before the last war was regulated by an international cartel (the Phoebus Agreement), and when the Commission were making their previous inquiry the industry in Britain was dominated by the elaborate restrictive arrangements of ELMA. At that time the members of this association were collectively restricting competition in the following ways:

(i) Prices and discounts were fixed by agreement.

(ii) Resale prices were maintained and there was collective enforcement of resale price maintenance.

(iii) Exclusive dealing was supported by several arrangements. To get trade terms for ELMA lamps wholesalers had to bind themselves not to sell any other brands. Retailers could get an additional 5 per cent discount if they agreed to confine their sales to ELMA brands. In addition aggregated rebates were paid to distributors based on their total purchases of ELMA brands, and payments were also made to associations of distributors.

(iv) The types of lamps which could be produced were subject to approval.

(v) There were restrictions on both the quality and the quantity of the cheap 'Type B' GLS lamps, which had been introduced in order to compete with imports and with the products of independent manufacturers.

(vi) There were restrictions on the supply of components to independent lamp manufacturers. Where components were supplied to independent manufacturers, they were charged higher prices than ELMA members, the Controlled Companies or ELMA members' licensees.

In addition, the ELMA members' share of the market (which the Commission estimated to be about 60 per cent of the total in terms of numbers of lamps) was apportioned between them in sales quotas under an agreement of 1948 which replaced the previous international arrangements under the Phoebus Agreement.

28. As a result of the recommendations made in the Commission's 1951 report on electric lamps, and of the Restrictive Trade Practices Act 1956 and the Resale Prices Act 1964, all these restrictions have been removed. At the same time there have been important changes in the structure of the industry. Partly these have been caused by changes in the market shares of individual manufacturers, but there have also been various acquisitions and mergers, in addition to the formation of BLI, which have markedly increased the degree of concentration in the industry. The figures used for the 1951 report are not fully comparable with those which we have compiled,* but they can be used to give an approximate indication of changes in market shares. On this basis, the largest supplier in 1966 (BLI) held 41 per cent of the market compared with about 21 per cent held by the largest supplier in 1950 (the AEI group). The four largest suppliers held 89 per cent of the market in 1966 compared with a corresponding figure of about 53 per cent in 1950. In terms of value of reference lamp sales, which is a more appropriate measure than numbers because of the wide range of prices, the largest supplier in 1966 had 43 per cent and the four largest 93 per cent of the trade.

29. The coverage of the industry's trade association has also changed. Although in 1950 ELMA was a tightly knit ring which included the principal manufacturers, there were substantial lamp manufacturers outside it (Thorn and Ekco-Ensign in particular, who were said to be similar in size to the medium-sized ELMA members) and it was estimated that the share of the total market held by independents was 20 per cent in respect of reference-type filament lamps and 41 per cent in respect of fluorescent lamps. In 1966 the share of the market in reference lamps of manufacturers who were neither members of ELIC nor controlled by ELIC members was only 3 per cent. The Controlled Campanies' share of the market also declined from 13 per cent in 1950 to 7 per cent in 1966 (only 3 per cent by value, since they make only the cheaper filament lamps).

30. A major change in the organisation of the industry took place in 1957 with the dissolution of ELMA and the creation of ELIC with the participation of Philips (which had resigned from ELMA in 1955), Thorn and Ekco-Ensign (in which Thorn had a controlling interest) as well as of the former ELMA members. This meant that all the principal manufacturers were now together in one association, and they were selling similar lamps at uniform prices and discounts; outside this group were various smaller manufacturers making limited ranges of lamps and competing actively in price. The products of the ELIC members were now referred to in the trade as 'ELIC lamps', with the implication that they correspond to the former 'ELMA lamps', and the assurance of conformity to established trading methods which this description gave was thus extended to Thorn. Lamps

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*The figures published in the 1951 report (paragraphs 2 and 3) related to total production in numbers of lamps of all types including flash lamps and motor lamps, and we have no information about individual manufacturers' production in 1950 of lamps of the types covered by the present reference nor about United Kingdom sales. However, ELMA members accounted for 63·5 per cent of production of reference-type lamps, and we have assumed for the purposes of comparison (i) that this was shared among the individual manufacturers in the same proportions as production of lamps of all types and (ii) that shares of production are comparable with shares of United Kingdom sales. The figures are calculated in terms of numbers of lamps because we have no value figures for 1950.

produced by non-ELIC manufacturers (except British Luma) were referred to generally as 'cheap lamps'; some of them had the same retail list prices as ELIC lamps but larger discounts were given and most of them were retailed at lower prices; their prices were not maintained (see appendix 6, table 1, for the retail prices of some typical lamps of both kinds). As under ELMA, with the minor exception of Crompton's cheap brand the principal manufacturers participated in the market for cheap lamps only through their holdings in the Controlled Companies.

31. Subsequently the principal manufacturers began to participate directly in the cheap lamp market. Thorn, which had no holding in the Controlled Companies, made the first move as early as 1957 by acquiring Omega, a company which supplied the cheap lamp market. In 1962 it also acquired Apex which brought half the Woolworth trade with it, and it formed Astralec to handle this business. Philips was the first of the Controlled Companies' shareholders to respond to this competition, when in 1963 it began to market a cheap brand of its own (Corona). In 1965 and 1966 it acquired controlling interests in Luxram and Kingston. In 1965 GEC acquired Ascot. Production by the companies taken over has been integrated to varying degrees with that of the parent companies. Ascot no longer manufactures and is now only a selling company; Omega still manufactures but its production has been fully integrated with that of BLI; Astralec is only a selling company; Kingston and Luxram are permitted considerable independence by Philips, but there is some integration of their production.

32. Thus, although there is still considered to be a separate market for cheap lamps, it is now very largely supplied by the principal manufacturers. The brand names and the methods of selling are different from those for main-brand lamps, but the lamps are virtually indistinguishable, type for type, many of them being made on the same machines in the same factories as the main-brand lamps. The only important physical distinction that is retained is that most of the second-brand GLS lamps have single-coil filaments, whereas the main-brand GLS lamps offered for sale in shops (apart from Crompton lamps) generally have coiled-coil filaments; on the other hand, a number of large users including some government departments, local authorities and trade users demand single-coil lamps, in both main brands and second brands, because they consider single-coil to be more robust. Apart from the matter of the filament there is virtually no distinction between main brands and second brands. Independent manufacture of GLS lamps is now insignificant. The largest independent manufacturer is British Luma* but it supplies almost entirely to the co-operative wholesale societies and does not normally enter into direct competition with other manufacturers. Maxim, the only other independent company making GLS lamps, has a very small share of the market.

33. There does not appear to have been anything inherent in the economics of lamp production or marketing which made this concentration of GLS lamp manufacture into the hands of the principal manufacturers inevitable. The small companies which they acquired were in no immediate danger of failure at the time of their acquisition nor, as far as we are aware, were they themselves actively seeking to be taken over. Those we have examined had been making satisfactory profits, and the only reason for their acquisition was the deliberate decision of the principal manufacturers to buy their way into the cheap lamp market. There does not in fact appear to be anything in the nature of GLS lamp manufacture which

*See footnote to paragraph 327

makes it impossible for small companies to trade successfully and, although there are economies available to large companies, they do not give the large company an overwhelming advantage.

34. We have examined the extent to which size brings advantages. In the mass production of the common GLS lamps scale economies appear to be relatively unimportant. A good deal of effort has been put into the development of intricate, automatic machines for the production of filament lamps (see paragraph 224), but highly productive machines are generally available and are not so costly that a small company cannot afford to install them. The most recently developed machines work at high speeds with very few operatives and, even when the higher depreciation has been taken into account, achieve a reduction of something like a halfpenny in the factory cost of a filament lamp (totalling about 6d.) as compared with the previous generation of machines. To achieve this, however, such machines need to be used for long runs and it is very important to maintain a high loading. Philips, for example, told us that one reason for its interest in acquiring control of Luxram and Kingston was that these companies' requirements of long runs would provide attractive additional loading for Philips' own machines (see paragraph 267). To the smaller company the inflexibility of such machines would be a drawback; where shorter runs are required, as they frequently are in the cheap lamp market, a smaller company can achieve sufficiently low production costs with the previous generation of machines to be fully competitive.

35. The economies achieved with the latest automatic machines are important in keeping costs down but they give the big companies only a relatively small advantage over small competitors because the assembly carried out on these machines is only a part of the whole process of lamp manufacture; about two-thirds of the factory cost of a GLS lamp consists in the cost of bought-in components. Variations in the prices of components make a much bigger difference to total factory costs than any differences in the productivity of machines. Small companies are at a disadvantage in this respect, and this is considered further in paragraphs 113–124. Nevertheless, it appears that despite this disadvantage the lower overhead expenses of small companies enable them to offer GLS lamps at competitive prices and still make satisfactory profits.

36. The development of the mass production of fluorescent lamps played an important part in the success of Thorn, and BLI has installed advanced machinery which produces cost savings comparable to those obtained with the latest GLS lamp machines (see paragraph 224). Nevertheless small companies have been able to produce fluorescent lamps competitively.

37. Neither in fluorescent nor in GLS lamps do patents and know-how present any serious obstacle to small producers, since the principles and designs are well established and the materials and components are generally available. Mercury and sodium discharge lamps are technically more complex, however, and it is probably the know-how involved, rather than any scale economies in production, which has limited their production to the main manufacturers.

38. In the selling of lamps, although exclusive dealing has long disappeared, the manufacturers of main brands still have a firm hold on the traditional channels of distribution. The reputation which the main brands have built up over the years makes their lamps readily acceptable to distributors and their customers, and a newcomer with an unknown brand would have to offer a substantial inducement to offset this. We were told that in filament lamps Thorn, with its main brand Atlas,

had found it difficult to compete against the longer established Mazda and Osram brands, with the result that in 1964 42 per cent of its sales of domestic GLS lamps were in second brands. Advertising has played a part in establishing the main brand names, but we were told that there is little brand loyalty as between main brands and expenditure on advertising is not high. Some retailers and users, for instance, order lamps from wholesalers by type alone and accept any main brand. In dealing with electrical distributors the principal manufacturers are at an advantage in being able to offer a comprehensive range of lamps. It is possible that their nation-wide distribution system also gives them some advantage, although on the other hand small companies can and do compete by offering particular attention to the needs of their customers.

39. Although therefore the established large manufacturers enjoy some advantages over small producers, they are not, as far as we can tell, such as to make the latter's survival impossible. Nor are there any insuperable cost obstacles to new entry to lamp manufacture, at least as regards filament and fluorescent lamps. However, although the threat of potential new competition from manufacture in Britain may exercise some influence, the fact remains that since 1957 the principal manufacturers have absorbed nearly all the independent competition that existed.

40. There remains a threat of competition from abroad. Imports of lamps have never been very large in the past; the international quota restrictions under the Phoebus Agreement and its successor agreement of 1941 restricted them until 1948 (see paragraphs 153 and 159) and the only significant supplier in the 1930's was Japan. In 1950 total imports were only about £250,000 when United Kingdom production was worth over £13 million. There has been some growth of imports since then and in 1966 the value was £1,732,000, equivalent to about 7 per cent of home sales. These imports were made almost entirely by the lamp manufacturers, over one-half of them being brought in from the Netherlands by Philips. Imports are said to consist mainly of types of lamps which it would be uneconomic for the importing manufacturer to make in this country, although in the case of Philips about 40 per cent of its sales are lamps (mainly discharge and fluorescent) imported complete from NV Philips and it imports some components as well (see paragaphs 60 and 64). To this extent therefore Philips' sales can be regarded as foreign competition. Apart from this, imports have offered little competition to United Kingdom manufacture, although import duties are not unreasonably high and we have found no evidence of any survival of market-sharing arrangements. With import duties being halved as a result of the Kennedy Round of tariff negotiations it is possible that other important European manufacturers in addition to NV Philips, and also the powerful United States manufacturers, might take a more active interest in the market in the future.

41. Although there is thus a possibility of new competition from outside the main group of United Kingdom manufacturers, either from new entrants to the industry or from imports, the amount of such competition at present is negligible. We have to consider, however, whether the acquisition of the cheap lamp manufacturers by the principal manufacturers has in fact reduced competition in the supply of lamps. Since second-brand and main-brand GLS lamps are made to the same BSI specifications and frequently on the same machines, there is some appearance of artificiality in the situation which has resulted from the acquisition of the former independent companies. We have also considered therefore whether, since main-brand lamps have been sold at list prices which have been virtually the same, the effect, if not the purpose, of supplying separate brands wherever the

market demanded lower prices has been to shelter the main-brand lamps from price competition.

42. The principal manufacturers represented to us that although there was virtually no distinction between comparable types of their main-brand and second-brand GLS lamps in quality or performance, there was a distinction of some importance in the service provided. They referred to the comprehensive distribution and rapid delivery service given all over the country for main brands and to the larger sales forces required to back them. Our examination of the unit costs of typical main and second brands of GLS lamps made by one company showed that almost the whole of the difference in cost (and in realised price) appeared under the heading of selling and distribution. This is only partly accounted for by the cost of advertising; some national advertising is given to main brands, but its extent is modest. Neither is it substantially accounted for by any great difference in distribution costs, except that the wider distribution of main brands requires larger stocks to be held. The manufacturers said that second brands could be sold more cheaply because they were purchased in bulk. However, it does not follow that there is bulk delivery, as might have been expected. Although bulk delivery to central warehouses is made in a few cases, the usual practice both for retail chains and for large users buying second brands is to contract centrally on terms related to bulk but to require deliveries in the quantities needed by individual ordering points. The economy therefore appears to arise in the selling more than in the physical distribution.

43. We were told that the main cost differences arise from the larger sales forces employed to service the large number of accounts for main brands involving, for example, visits to all retail outlets even though supplies may not be delivered by the manufacturer direct. Such a service is more necessary for main brands because of the very wide range of lamps supplied, many of which are of interest only to electrical wholesalers and retailers, electrical contractors and users with special technical requirements. Chain stores, supermarkets and some users, on the other hand, want only a limited range of popular lamps and know what types they want, so that little technical salesmanship is required. This explains the difference in the selling costs of second-brand lamps on the one hand and of main-brand lamps as a class on the other, and this difference was reflected in our analysis of unit costs. However, for the purpose of this analysis selling costs had to be allocated between the different types of lamp sold under a main brand in proportion to their sales value, for want of any more realistic method, and this may give a misleading picture. The main-brand sales force exists primarily for the purpose of selling the more technical lamps, and GLS lamps in the popular sizes require very little selling effort. The true cost of selling such lamps seems likely, in fact, to be little more if they are in a main brand than if they are in a second brand and, if it were possible to isolate the costs relating to a particular lamp, main-brand GLS lamps would probably be shown to yield a higher profit than a simple analysis suggests and much higher than on a corresponding second-brand lamp.

44. Those distributors, mainly retailers, who do not want the full range and service of the main brands are able, by taking second brands, to offer lamps at lower prices than main brands while at the same time taking similar cash margins. There is therefore some validity in the distinction between a main-brand market and a second-brand market at the distributor level. Accordingly, while second-brand lamps do not compete directly with main-brand lamps in sales to electrical wholesalers and retailers, they do provide some competition in sales to the

domestic consumer, who has the choice of buying cheap second-brand lamps from a chain store or the like or main-brand lamps from an electrical retailer.

45. There is no corresponding separation into distinct markets in sales to such customers as public authorities (the Central Electricity Generating Board (CEGB), electricity boards, gas boards, local authorities and some hospitals) and other large users (including British Railways Board (BR) and the London Transport Board (LTB) as well as industrial and commercial companies). In this field there is no price competition between manufacturers in supplying main-brand lamps, but they do offer second-brand lamps at prices which are competitive with main brands and which vary among themselves.

46. In some cases such customers may be offered main-brand and second-brand lamps actually made on the same production line and, as we have shown in paragraph 42, the difference in the prices does not appear to be justified by any difference in the cost of supplying them with the alternative brands. The superior service offered with main brands or their more comprehensive range do not explain sufficiently how main brands manage still to sell in competition with second brands in this field. From the evidence of some of our witnesses, prejudice and inertia appear to play a part; some users are unaware that most lamps which are available in second brands and main brands are now virtually identical; some had been put off by the inferior performance of certain cheap brands at the time when they were made by small independent companies and had not tried them recently. Such reluctance to buy second brands is declining, however, and second brands are taking an increasing share of the market. We were told that figures collected by ELIC showed that in 1967 second brands accounted for 44 per cent of members' sales of GLS lamps, including candle and decorative types. We have no directly comparable figures for earlier years, but the proportion of cheap lamps must have been substantially lower since in 1950 non-ELMA lamps were 37 per cent of total output (by number) of filament lamps over 24 volts and a proportion of those non-ELMA lamps were accounted for by the Thorn and Ekco-Ensign brands, which are now included in the main-brand figure.

47. In view of the greater profit made on main-brand than on second-brand GLS lamps the main-brand manufacturers might have been expected to have an interest in limiting the transfer of sales to second brands. But we have found no evidence of any curtailment of the sales effort put into the cheap brands which have been taken over by the main-brand manufacturers, nor have they made any attempt to restrain the growth of sales of filament lamps through non-traditional distributive outlets which generally prefer cheap lamps. We were told by one manufacturer that in sales to distributors second-brand salesmen would not normally try to take business away from their own company's main brand, but they would do their best to take business away from other manufacturers' main brands. In direct sales to users, including sales by tender, second brands, as we have said, compete directly with all the main brands as well as with each other. We do not consider therefore that the principal manufacturers' acquisition of the cheap lamp companies has reduced the total amount of competition confronting the main brands. It may indeed have strengthened it slightly because of the greater resources which the manufacturers can put behind their second brands; they may achieve lower production costs at least for the types of lamps required in long runs and, whereas formerly there may have been quality differences, second brands and main brands of the same type are now in effect the same product and second brands are, as has been shown, becoming more generally acceptable. To

the extent that the second brands are now in a stronger position, however, it may be more difficult for a newcomer to enter the market. The Controlled Companies have similarly been faced with greater competition.

48. In the light of this analysis we do not consider that the effect of the supply of second brands by the main-brand manufacturers is to shelter the main brands from price competition to any significant extent. Second brands are not acceptable to every kind of customer; where they are acceptable they are offered competitively and, as we have said, are taking a growing share. The difference in the prices of second-brand and main-brand lamps has in any case decreased over the years (largely by the reduction, in real terms, of the former high prices of main-brand lamps) and it is possible that the price difference may become even less. We conclude that the acquisition of the cheap lamp manufacturers by the principal manufacturers has not reduced competition in the supply of lamps.

Competition

49. We next consider whether competition is in any way restricted. The market situation is substantially different from that which the Commission investigated in 1950. At that time competition was closely regulated by a restrictive agreement in one part of the market, but there was also substantial competition from independent manufacturers at least in fluorescent and GLS lamps, although not in mercury and sodium discharge lamps. Now there is no longer a restrictive agreement, but almost the whole of the market for lamps of all types is in the hands of three manufacturers. In this situation it is of greater importance than before that these manufacturers should be fully in competition between themselves. There is a risk that oligopoly may have the effect of restricting or distorting competition and moreover that, although there are no restrictive agreements, the patterns and habits of trade established by collective action extending over many years may continue to have an influence.

50. There are various signs that competition between the principal manufacturers has become more active. There is for instance lively competition in selling and the market shares of individual companies have changed as a result. The outstanding example of this has been the growth of Philips' share from about 6 per cent of the whole market in 1950 to over 21 per cent of the market in reference lamps in 1966, excluding Luxram and Kingston. The history of lamp prices (see appendix 8, table 4) suggests that competition has been effective in restraining increases and in encouraging the improvement of production methods. Prices have remained remarkably stable over long periods, and some types of lamp are actually cheaper now than they were before the war. Nevertheless, we have found various features of the arrangements of the individual members of ELIC which appear to echo certain of the former restrictions referred to in paragraph 27. For example, there has been considerable uniformity of prices and discounts for main-brand lamps and changes in them have often been introduced almost simultaneously; discounts to distributors and most users have been based on purchases of lamps from all sources and not on the amount purchased from the individual supplier; the range of lamps supplied by each of the principal manufacturers is substantially identical and there is prior discussion in ELIC when new types of lamps are introduced; and small manufacturers are charged much higher prices for certain lamp components than the principal manufacturers pay. We have therefore thought it necessary to examine the relations between the principal

manufacturers in detail in order to discover whether such features as these indicate that the situation has not been materially changed by the removal of the previous formal restrictions and that competition is still being restricted.

Prices

51. The most obvious danger to be expected in an oligopoly situation such as now prevails in electric lamps is that competition will concentrate on such matters as service, advertising and other forms of salesmanship but that competition in price will be avoided. Under ELMA lamp prices were fixed by agreement, but this ended in 1956; ELIC has never concerned itself with list prices of lamps, although in 1957 it adopted a recommended non-mandatory trading structure which laid down discounts to be applied to various classes of customer. This recommendation of discounts was brought to an end in 1959. However, many of the buyers of lamps from whom we took evidence (see chapter 9) complained that there was still no price competition in ELIC lamps and that both list prices and discounts for any type of lamp were uniform whichever ELIC manufacturer was supplying. Even when contracts were let by public tendering the quotations submitted by the ELIC manufacturers were, we were told, normally identical at the list prices less a standard discount. Moreover, when a large purchaser succeeded in negotiating a special discount, the same discount would then be made available by all the ELIC manufacturers; some customers of this kind had even been led to understand that the concession of a special discount had been authorised by ELIC. We found by comparison of the price lists of the ELIC manufacturers that, with insignificant exceptions, the list prices of main-brand lamps were identical, type for type, whichever manufacturer supplied them. (Main-brand lamps include all mercury and sodium discharge lamps, most fluorescent lamps, and a substantial part of the filament lamps supplied by the members of ELIC.) We also found that, until March 1968, the discount schedules operated by the members of ELIC were identical; each classified their wholesaler and user customers for discount purposes in the same way, and the net prices which they charged to such customers were therefore also identical, type for type. A similar uniformity of prices appeared also in sales of main-brand lamps to the general public. On the face of it, therefore, the evidence suggested that despite the ending of collective price fixing in 1956 and of resale price maintenance in 1967 there had been no appreciable increase in price competition.

52. The evidence which we collected from purchasers of lamps and the account of the similarity of prices and discounts given in the previous paragraph relate to the situation which prevailed throughout most of the period of our inquiry. Our discussions with the principal manufacturers themselves also took place on the basis of this situation. Our analysis of the situation has been complicated, however, by the fact that changes were currently taking place and they have accelerated since our discussions with the parties and other witnesses were held. During 1967 there were signs of increasing independence of action among the principal manufacturers. In April BLI took the lead in introducing a new discount structure, although it notified its competitors in advance (see paragraph 313). We were told of certain confidential discounts given by manufacturers to a few customers, which amounted to concealed departures from the normal uniformity of prices, and in the autumn of 1967 we were given to understand that competition between manufacturers in selling to wholesalers had taken discounts to what were regarded as 'ridiculously high' levels, although they subsequently returned to

normal. Certain manufacturers told us that they would not feel it necessary to inform their competitors in future of any changes in prices or discounts, and in March 1968 Philips introduced an extensively altered discount structure without either consulting or informing the other manufacturers in advance, although it informed ELIC after the event in accordance with the arrangement for monthly notification of changes (see paragraph 322). Although BLI and Osram have since made some changes in their discount arrangements, they have not adopted the new Philips structure. We have taken these latest developments into account in reaching our conclusions on price competition.

53. In discussing competition in the supply of lamps the principal manufacturers argued that the uniformity of prices did not indicate a restriction of competition but, because of the nature of the product, actually resulted from intense competition. They pointed out that the corresponding lamps produced by all of them were not only interchangeable but, in most cases, virtually identical in performance and characteristics; customers therefore had no hesitation in changing from one brand to another if they were offered any price incentive to do so, and small variations in price would therefore have a disproportionately large effect on sales. Since each of these manufacturers was faced with powerful competitors, it was not possible, they said, for one of them to raise prices without a disastrous loss of trade, nor was it possible for one of them to reduce prices without the others following. The manufacturers also drew attention to the way in which lamp prices had been held down over a long period, and argued that price competition had forced them to seek ways of absorbing rising costs by introducing more efficient methods.

54. The price record of the industry in recent years does suggest that prices have been influenced by competition or the threat of it. For example, prices of popular GLS and fluorescent lamps in real terms, and in some cases even in money terms, have fallen since 1950 (see appendix 8, table 2). Although international price comparisons are hazardous in detail, such a comparison does suggest that the British industry has made a substantial improvement; at one time British lamp prices were among the highest, but now they are, in general, as low as any to be found in the main lamp-producing countries (see appendix 8, table 5). The manufacturers have made considerable efforts to reduce costs by developing and introducing more advanced machinery and also, in the last year or two, by seeking more economical methods of distribution; we have no doubt that competition between them has acted as a spur. The rates of profit earned on reference lamps as a whole by the three largest manufacturers have not been such as to suggest that they have in general been exercising undue market power, although it may be significant that the rate of profit on sales on discharge lamps is higher, in some cases over three times higher, than that on filament lamps (see paragraphs 473 and 488). To some extent this may be justified because the bulk of filament lamps are the common GLS types which have been in production virtually unchanged for many years, whereas there has been much development in discharge lamps. But it is also relevant that discharge lamps are almost entirely main brands, and mercury and sodium lamps are made only by the three principal manufacturers (apart from one type made by Crompton); in filament lamps, on the other hand, there is a history of 'cheap lamp' competition, first from independent manufacturers and now from the principal manufacturers' second brands, and these lamps are also affected by the purchasing power of chain stores, especially Woolworth. It is reasonable to conclude, therefore, that profit levels, and so price levels, have depended partly on market power.

55. We accept that in a competitive situation it is likely that prices for such readily interchangeable products as lamps will settle at much the same levels, and some similarity of prices does not necessarily indicate lack of competition. Some matching of competitors' prices seems inevitable in competing to supply identical products to the same customer. Nevertheless there are various features of the trade which suggest that the degree of price uniformity which has been and to some extent still is apparent in main-brand lamps is not solely the result of competition. For example:

(i) Despite the general prevalence of level tendering, the manufacturers have for years submitted genuinely competitive tenders for the Government and Greater London Council (GLC) contracts and a few others; we were told by one of them that it was 'understood' that price competition operated in this area.

(ii) In tenders where identical prices are quoted for main-brand lamps prices are quoted for second-brand lamps which not only are lower than the level quoted for main brands but also differ among themselves, although the argument that they are interchangeable applies equally to them.

(iii) Price and discount changes and even a whole complicated discount structure have in the past been introduced by all the ELIC members in the same terms virtually at the same time. Philips' new structure in March 1968, which was not followed by the other manufacturers, was the first major departure from this custom.

(iv) In general the prices of 'cheap lamps' tend to be uniform in shops at the level set by Woolworth, even though they are not recommended by the manufacturers; but there are price reductions by Woolworth, other chain stores and certain area electricity boards during special promotions and these are not matched by other retailers; nor do retailers of main-brand lamps find it necessary to match the second-brand prices. Complete uniformity of retail prices is therefore not inescapable, even when the lamps are virtually identical.

(v) When active price competition does occur between the manufacturers in selling main brands to distributors (as for instance when they were vying with each other in special promotions and extra seasonal discounts in the autumn of 1967—see paragraph 197—and again in the present situation with Philips following substantially different discount arrangements from the others), net selling prices to distributors are reduced but there are no consequent reductions in prices to the general public.

56. We therefore consider that, although competition between the manufacturers has exercised a restraining influence on prices, price competition in the supply of lamps has been and to some extent still is inhibited in some respects, and we next discuss the reasons for this.

57. We deal first with the manufacturers' prices in direct sales to their customers. Because of the interchangeability of lamps, the manufacturers' sales are highly responsive to price differences. It follows therefore that price differences of a general nature (by which we mean differences in the level of list prices or of standard discounts) cannot be expected to exist for very long. We were told for instance that a special sales promotion scheme introduced by one manufacturer in the autumn of 1967 produced an immediate fall in the sales of a competing manufacturer, who was therefore forced to respond within a few weeks with the

offer of a temporary additional discount. But, although this is true in general, we would nevertheless expect to see price differences of two kinds. The first is temporary differences in prices or discounts as one manufacturer seeks to gain advantage over his competitors. Although this was in fact what happened in the episode referred to above in the autumn of 1967, previously the normal situation had been for changes in prices or discounts to be uniform and to be introduced by all the manufacturers simultaneously, or at least within a few days of one another, so that there was no effect on their relative sales.

58. Secondly we would expect manufacturers to be ready to quote different terms to individual customers. In considering this a distinction can be made between sales to distributors (both wholesalers and retailers) and sales to the various kinds of user customers. In the former case, the manufacturers explained to us that, because there is so little brand loyalty, it is important for each of them in promoting its trade to make sure that its brands of lamps are stocked in as many outlets as possible. For this reason they have traditionally acted on the assumption that they must match their competitors' prices to every distributor even when supplying in small quantities, and discounts have been based on the distributor's total purchases of all brands from all sources and not on the size of his business with a particular supplier. Consequently wholesalers and even retailers of main-brand lamps have normally stocked several brands of each type of lamp. This form of competition encourages small deliveries and large stocks, and we heard some evidence that distributors were beginning to realise that it was uneconomic to carry several brands. During the course of our inquiry the manufacturers began to encourage a move away from this system; the discount structure which they introduced in April 1967 included quantity discounts for wholesalers (related to single consignments) in addition to the discounts based on their total purchases from all sources, and the structure introduced by Philips in March 1968 also gave wholesalers the possibility of a basic discount based on total business with Philips alone, although discounts based on total purchases from all sources remained as an alternative (see appendix 8, table 6). Other manufacturers have also given some wholesalers basic discounts related to total purchases from themselves and have also introduced additional quantity discounts. But discounts based on total purchases from all sources still survive in all the main-brand manufacturers' discount arrangements for sales to wholesalers.

59. The need to compete in terms of number of outlets does not explain why main-brand manufacturers should offer the same net prices (i.e. discounts off list prices) in the case of direct sales to users. There is normally no reason why users should need to take their supplies of any particular kind of lamp from more than one supplier (unless, for example, the quantities required were too big for a single supplier, which is unlikely, or if deliveries were wanted in widely separated places and different suppliers were better placed to serve different areas). We find in fact that some users have split their purchases of one type of lamp between suppliers for a variety of reasons, and in the circumstances they have lost nothing by doing so, since all suppliers of main-brand lamps have been offering the same prices and discounts and, except in the case of local authorities, the users were classified according to the size of their total purchases from all sources. For local authorities, until April 1967 the discounts depended on the type of authority and the population; thereafter all local authorities had the same discounts, although there are big differences in the size of their individual requirements. If competition was operating fully, we would in principle expect each supplier to quote a price to a user according to the cost and the value of the business to him. This does not

mean that prices should be separately negotiated with all the numerous user customers; standard terms related to quantity would be appropriate in the majority of cases, but prices might be individually negotiated for the largest customers and individually determined offers ought in our view to be made where public tenders are invited. Each user would then place his business with the supplier whose quotations and service arrangements seemed most advantageous, and the resulting division of the total business among suppliers should be conducive to maximum efficiency and should give the most economical and satisfactory service to the customers. In practice, however, the prices and discounts quoted by manufacturers to users for main brands have been identical and in most cases have been unrelated to the total quantity required from an individual manufacturer, to the size of individual deliveries or to the service required in other respects. Philips' new discount structure, which gives scales of consignment quantity discounts for users (including local authorities) departs completely from this practice, but it is not yet clear to what extent the other manufacturers will discard the present classification system for users, nor do we know whether significantly more price competition can now be expected in public tenders.

60. To some extent any lack of competition in the supply of main-brand lamps to users is mitigated by the fact that second-brand lamps offer genuine competition in the types of lamps in which they are made. However, there are no second brands in sodium and mercury discharge lamps and few in fluorescent lamps, both of which types are important to many industrial users and local authorities. The manufacturers also represented to us that the uniformity of their prices to users was unimportant because there was, since and even before the abolition of resale price maintenance, keen competition from wholesalers. We have sought evidence of this by inquiries among wholesalers and lamp users, and have found confirmation that in some cases wholesalers do quote lower prices than manufacturers, for instance when they are also supplying or hoping to supply the customer with other electrical goods. Active price competition of this kind is by no means general, however, and the evidence which we collected in 1968 showed that many users were still in 1967 faced with level tenders from all suppliers of main brands (see chapter 9).

61. The inhibition of price competition in both the respects discussed (the avoidance until recently of even temporary differences in the general levels of prices and discounts, and the uniformity of manufacturers' net prices to individual customers) has rested on the same foundations. Formerly both were achieved by agreement between the manufacturers; prices were closely regulated by the comprehensive provisions of ELMA and, even after the abolition of ELMA, the members of ELIC operated a 'recommended non-mandatory trading structure' until the end of 1959 (see paragraph 171). After that, however, similar results were achieved without prior agreement between the manufacturers. No doubt they each considered that it was in their interest to avoid price competition in these respects, and they were able to do so because, as we explain below, they could each safely make assumptions about their competitors' actions.

62. This knowledge of how competitors would behave depended, first, on the practice of selling in terms of list prices with a regular discount schedule which classified customers for discount purposes largely on their total purchases of all brands of lamps from all sources. Because of this, each of the manufacturers knew that the list prices of his competitors' lamps were the same as his own and also that each of them allowed the same discounts to each class of customer. It

follows that in submitting tenders to user customers, for example, each would be confident that the tenders submitted by his principal competitors for main-brand lamps would be identical. Each knew that it was the practice to depart from these terms only in tenders to the Government, the GLC and a few other large users. The manufacturers explained that, apart from these exceptions, they adhered to their standard terms even in public tenders in order to avoid competing with their own wholesalers.

63. The second important factor was the exchange of information through ELIC. ELIC's original recommended trading structure (which was registered under the 1956 Act) was supported by provisions for the exchange of information; lists of users and wholesalers, divided into classes for discount purposes, were provided to members and kept up-to-date, and members agreed to inform each other through ELIC, monthly in arrears, of departures from this classification. This meant, in effect, that they notified each other of changes in discounts to particular customers or classes of customers. When the recommended trading structure was withdrawn at the end of 1959, it was replaced by a discount schedule, that is, a schedule of classes of customers for discount purposes (see paragraph 172); actual discounts were left to members individually and they continued to be uniform. But the information arrangements were continued. Thus each member individually had the same schedule of discounts as the other members, and the information arrangements ensured that these discounts were applied uniformly to the same customers; moreover where, as in the case of a very few large or important users, special discounts were given which were outside the standard discount schedule, all the members were normally informed of this and generally offered the same terms.

64. There have since 1956 been no corresponding arrangements for the exchange of information about list prices and we have been told that ELIC itself is not concerned with prices. There have however been varying degrees of notification or discussion of changes in prices (see, for example, paragraph 236). We were told that manufacturers generally mentioned proposed price changes to their competitors in order to test their reactions; it was explained that this was because a manufacturer contemplating a price change needed to know and to take into account whether or not his competitors would follow the change. As an example of this we found from the records that in 1960 Thorn discussed with its competitors a proposal to reduce the prices of fluorescent tubes. It has also been customary, whether or not there has been any prior discussion, to inform competitors of proposed changes in advance. Thus in 1964 Philips informed its competitors in advance of the changes that it was about to introduce in list prices and discounts for sodium and mercury discharge lamps (see paragraph 191) and its discount proposals were discussed at a joint meeting of ELIC and the EWF. Again, the members of ELIC discussed the general principles of a new discount structure that would be required following the ending of resale price maintenance, and we were told by BLI that it informed all its competitors at the beginning of March 1967 of the new discount structure which it proposed to introduce at the beginning of April. They promptly introduced virtually identical structures (see paragraph 196).

65. The effect of all these arrangements and practices relating to discounts and prices has been to remove uncertainty about competitors' activities. It is true that customers are not slow to tell one supplier what they have been offered by another, but such information is not as trustworthy as information provided by the supplier himself. We see no justification for any notification of changes in prices,

nor for the advance sounding out of competitors' likely reactions. It may be understandable that a company should think it prudent to explore these reactions before introducing a price increase, because of the damage to its trade if others did not follow, but it does not have the same reason for informing them of a proposed price reduction, since they are bound to follow anyway once they know about it and the advance information merely ensures that changes are virtually simultaneous. In either case the practice weakens the incentive to keep prices down. As long as prices are not changed without informing competitors (whether by agreement or as a matter of practice), there is no possibility of one manufacturer's improving his market share by a price reduction. If information is not exchanged, a price change may become known in due course but there is a time lag or period of uncertainty, during which a price reduction can bring increased trade, and this may not necessarily be wholly temporary if it leads to some extra goodwill.

66. The same considerations apply to the arrangements for the exchange of information through ELIC about the classification of customers and about changes in discounts or other trading arrangements. The manufacturers argued that these arrangements were now of little importance and were no more than a slight convenience. In the more fluid situation prevailing since March 1968 there is clearly something in this, and the manufacturers are at present much more concerned than in the past to conceal their selling tactics from their competitors. But the exchange of information generally has certainly helped to delay the appearance of price competition since 1956; even now it helps in the preservation of uniform list prices and in the operation of the discount classifications which remain; and furthermore it can be expected to continue in the future to act as an influence in the direction of uniform prices and discounts. The exchange of information about prices and discounts appears to us to be quite unnecessary and we see no reason why the individual manufacturers should not rely on their own sources of commercial intelligence.

67. This criticism does not apply to the ELIC arrangement whereby statistics of total production and deliveries of lamps by the members are compiled and circulated (see paragraph 174). This has no restrictive effect and may even serve to stimulate competition, since it enables each member to calculate the progress of its own share of the market.

68. In the foregoing paragraphs we have been considering competition in price between the manufacturers of main-brand lamps in sales to their immediate customers. We turn now to resale prices. Until the beginning of April 1967 the resale prices of main-brand lamps were maintained by the manufacturers, acting individually. They decided not to proceed with their application for exemption from the Resale Prices Act 1964 and since April 1967 resale prices have been only recommended. Philips, indeed, states that it does not recommend resale prices (see paragraph 278). However, it still sells in terms of published discounts off published list prices. Distributors appear to be generally unaware of the difference and their pricing of Philips' lamps is no different from that of other main-brand lamps. In considering recommended prices, therefore, we include the practice of using retail list prices as a basis for trading.

69. We have made widespread inquiries among wholesalers, retailers and other buyers of lamps both before and after the end of resale price maintenance and have found that its ending has not greatly increased the amount of price com-

petition between distributors. There was evidence that some wholesalers found ways of circumventing resale price maintenance even before it had been abolished, and since then they have of course been able to make price concessions openly. Some take advantage of this to offer additional discounts to buyers when it suits them to do so, but this practice is not widespread and we are satisfied that the majority of sales by wholesalers are made at the recommended prices and discounts.

70. The question is whether the recommendation of prices and discounts is the reason why there is not more price competition among wholesalers. The manufacturers told us that they had been positively encouraging wholesalers to take a greater share of distribution, and so there is no reason why wholesalers should feel inhibited about entering into competition with the manufacturers who are also their own suppliers. The recommendation of prices and discounts does not prevent wholesalers from charging more; what prevents that is the fact that the manufacturers are prepared to sell direct to the wholesalers' customers at the prices and discounts which they recommend, and no recommendation is therefore needed for this purpose. It follows that if recommendations have any effect on wholesalers' prices it can only be in the direction of restraining them from cutting prices. It is possible that the recommendations have scarcely any effect, and that where wholesalers do not compete in price it is because it is not profitable for them to do so. But we think it more likely that the recommendation of prices encourages wholesalers to continue following the pattern set by years of maintained prices without examining their own costs. Some of the electrical wholesalers themselves took the view that lower prices to the consumer would result if wholesalers set their own selling prices without guidance from manufacturers. However, the lack of price competition between retailers of main brands (see below) probably has more effect on the price to the consumer, and at the same time means that there is little pressure on wholesalers to reduce their prices to retailers.

71. In sales to the public by retailers we have found practically no evidence of any departure from recommended prices for main-brand lamps, although some retailers give discounts for quantity to commercial buyers. The manufacturers said that the reason for this was that domestic users were, on the whole, uninfluenced by the price of lamps and bought them only when necessary, so that reduced prices in the shops could not be expected to promote any extra trade. Moreover lamps were not attractive to electrical retailers because they occupied a disproportionate amount of shelf space for their value, and because they were fragile and slow-moving. Electrical retailers therefore took little interest in them and stocked them mainly as a service to their customers.

72. There are, however, some considerations to set against these arguments. The manufacturers themselves said that lamps were attractive to grocery outlets, and the fact that the cheaper, second-brand lamps, the resale prices of which were never maintained and are not now recommended by the manufacturers, have been taking an increasing share of the domestic market suggests that consumers are, in fact, attracted by lower prices; moreover Woolworth and other chain stores find it worthwhile to reduce lamp prices during the course of periodic sales. The percentage margins on lamps are generous, at least by the standards of the grocery trade. It is argued that, because lamps cost little, the total cash profit to be made by a retailer from selling lamps is nevertheless small, but even so we think that lamp business must have some value to electrical retailers in bringing customers into the shop who may then stop to buy other and higher

priced goods. It would be unrealistic to expect the emergence of dramatic price cutting by retailers of lamps, but we consider nevertheless that the existence of retail prices listed, if not specifically recommended, by the manufacturers has discouraged price competition between retailers and has, in effect, prolonged the influence of price maintenance.

73. It has been put to us in support of recommended prices that the use of list prices with different discounts for sales at different levels of distribution is a convenience to manufacturers and distributors in invoicing and to retailers in pricing their stock. We do not attach much importance to this since there appears to be little difficulty in adding a mark-up to a net purchase price in order to arrive at a selling price. It is true that electrical retailers who specialise in lighting may carry a wide range of lamps, but manufacturers' prices change infrequently and we would not consider that pricing his stock was a heavy burden for a retailer. In any case there is much to be said for a retailer's deciding his own selling prices in relation to his own costs. It has also been argued that recommended prices act as maximum prices and that some retailers, especially in sparsely populated areas, would charge higher prices if it were not for their existence. We doubt whether this would happen very much, since there can be few shops selling lamps which are not influenced to some extent by competition from neighbouring towns; and, in any case, if higher prices in a few shops did no more than reflect higher costs of distribution and stockholding in remote places we would see no objection to them.

74. In our view the general effect of recommended prices for lamps is to discourage, or at least to delay, the introduction of more efficient distribution and selling. Lamp distribution is characterised by very widespread deliveries in small lots and by wholesalers' and retailers' stocking a variety of brands of lamps which are indistinguishable in performance. Partly this has been caused by the use of discounts unrelated to the size of deliveries, which reduces the incentive to cut costs by concentrating purchases and taking deliveries in bulk. The manufacturers endeavoured to improve matters in April 1967 by the introduction on a limited scale of quantity discounts for single deliveries for wholesalers (and their extension for retailers) and this practice has been further extended in 1968. But the fact that retail prices are recommended and retailers follow the recommendations also reduces the pressure to find more economical distribution methods. The margins allowed within the recommended resale prices appear high; the gross distributive margin for wholesale and retail combined can be as much as 46 per cent, apart from any special seasonal discounts or promotions. We were told that this was necessary because lamps are so bulky and slow-moving but, although this has some force as regards GLS lamps, such margins appear very high for the more expensive fluorescent lamps. Moreover, when active price competition does break out between the manufacturers, the only result is to increase still further the margins available to distributors and no benefit reaches the consumer.

75. We have also considered whether the practice of inter-trading (see paragraph 199) has any effect on price competition. Apart from sales to the Controlled Companies, between 2 and 5 per cent of the principal manufacturers' sales of lamps are generally made to other manufacturers, partly to small companies such as British Luma but very largely to each other. It might be thought that a manufacturer would be willing to supply lamps for resale under another manufacturer's brand name only if he had some assurance that the lamps would not be used to

undercut his own normal trade. We have no doubt that the general uniformity of list prices facilitates inter-trading, but we do not consider that inter-trading is itself a cause of that uniformity. Inter-trading falls into two classes. The first comprises *ad hoc* purchases of lamps to make up temporary shortages or to avoid uneconomically short runs; cost is saved thereby, and the sales are made at negotiated prices without any agreement on resale prices. These arrangements underline the fact that lamps made by all the manufacturers are identical and the customer is normally unaware when he buys one manufacturer's brand of lamp that it may in fact have been made by one of his competitors.

76. The other class of inter-trading consists in the regular purchase of types of lamps which the purchaser does not himself produce. One example of this is the supply to the principal manufacturers of special types of lamps produced in relatively small quantities by small companies such as BELL, Long Lamps and Evenlite, where it would be uneconomical for all the principal manufacturers to make such lamps themselves. This is an economical arrangement, analogous in effect to the specialised production of lamp components, and it does not entail any restriction of competition. Another example arises when one manufacturer has perfected a type of lamp which the others are not producing. This has happened, for example, in sodium discharge lamps, in which different manufacturers have been pursuing different lines of development (see paragraph 199). Where one type is produced only by one company, instead of that company seeking a sales advantage from its unique development it is generally willing to supply lamps to its competitors, who then include the lamp in their regular ranges and sell it under their own brand names. The manufacturers do not consider that they forego any competitive advantage thereby; they say that having their lamp marketed by their competitors as well as themselves increases the total sales and enhances the acceptability of the lamp to users (apparently because users have come to expect each type of lamp to be available in several brands, and may think that a type unique to one brand either is of doubtful merit or might be difficult to replace). They argue that the practice increases competition because the customer has a choice of suppliers of the same goods. The practice is not unique to lamps, and we accept that in reselling a type of lamp made by his competitor a manufacturer is performing a function analogous to that of a wholesaler. We do not think that either type of inter-trading is the reason for the uniformity of lamp prices.

Conclusion on price competition

77. To summarise our conclusions so far, with the structure of the electric lamps industry which has emerged in recent years it is especially important that the principal manufacturers (meaning primarily BLI, Osram and Philips) should be fully in competition. There is a long history of avoidance of price competition in the industry through restrictive agreements, all of which disappeared by 1956. As a result, competition in the industry has increased and it has imposed some restraint on the level of prices. There has been a marked increase in price competition during the later stages of our inquiry, but its appearance was long delayed after 1956 and even now we consider that the prices charged both by manufacturers and by distributors for main-brand lamps are, in certain respects, uniform to a greater extent than would result from the free play of competition.

78. We conclude that the conditions to which the Act applies prevail because at least one-third of the supply of lamps of each of the descriptions referred to us

is supplied by two or more persons who so conduct their respective affairs as to restrict competition in that:

(i) manufacturers who together supply at least one-third recommend or otherwise suggest the resale prices of the bulk of the reference lamps they sell and the distributors generally follow the recommendations;

(ii) manufacturers who together supply at least one-third relate prices for individual buyers to the buyer's total purchases from all suppliers;

(iii) manufacturers who together supply at least one-third (a) by arrangement exchange information through ELIC about the total purchases of wholesaler and user buyers and about discounts granted to such buyers, and (b) generally inform each other of changes in prices or discounts.

79. As we have shown, the prevalence of these conditions has the following effects which are detrimental to the public interest:

(i) distribution tends to be wasteful and the development of more efficient and economical methods is inhibited;

(ii) when the manufacturers compete in price this results only in higher discounts to distributors and no benefit to the general public;

(iii) with a few exceptions, large users including public authorities are unable to get genuinely competitive quotations from manufacturers of main-brand lamps even by public tender. Where there is no alternative to main brands, as in the case of mercury and sodium discharge lamps, they are likely to have to pay, on average, higher prices than necessary.

We do not consider that any of the arguments which have been advanced in support of the practices referred to above outweigh these disadvantages. We recognise that second-brand lamps provide an alternative and more competitive supply which avoids these disadvantages, but this applies almost entirely to GLS lamps and leaves a very wide range of lamps in which there is no alternative to main brands. We therefore conclude that the conditions in question operate and may be expected to operate against the public interest.

80. To remedy the mischiefs which result from these conditions we recommend, first, that lamp manufacturers should no longer recommend resale prices. As we have shown in paragraph 68, however, the same effect as an explicit recommendation of resale prices is produced by the practice of publishing retail prices and of negotiating sales to distributors in terms of discounts off those prices. Since the manufacturers sell direct to retailers, contractors and users as well as to wholesalers it may be impossible to avoid this effect entirely; the prices at which they are prepared to sell to these customers, however they are expressed (e.g. as a basic trade price subject to consignment quantity discounts), would still act as an upper limit for wholesalers selling to the same customers and might have the same effect as a recommendation. However, price recommendation has more direct effect on retailers' prices than it does on those of wholesalers, and it is important that the manufacturers should not suggest or indicate retail prices in any way. They should therefore cease to use lists of retail prices as a basis for trading. Sales to retailers should be made at net prices and it should be left entirely to the retailer to determine his mark-up and to fix his own selling prices accordingly.

81. Secondly, we recommend that in their standard terms the manufacturers should no longer base any of their standard discounts on buyers' total purchases

from all sources or other assessment of total purchasing potential. The prices to individual buyers should be related to the cost of supplying them and to the value of their business to the supplier. Since distribution costs vary with the quantities delivered the most appropriate method, and the one most conducive to efficient distribution, is a suitable scale of discounts related to the size or value of individual consignments. We would however see no objection in the circumstances of this industry to terms which also, if a manufacturer so wished, gave some recognition to the size of the whole order (covering more than one consignment) or to the value of the total business which a buyer places with him. We would also see no objection to the provision of different scales of discounts for wholesalers, retailers and other buyers if the manufacturers considered it desirable to give wholesalers and retailers some extra reward in recognition of their part in selling and distributing. We can see no reason, however, for any differentiation in treatment between one class of user buyer and another which is not related to the cost or value of the business to the supplier.

82. It is of course for individual manufacturers to determine the actual scales of discounts appropriate for their own businesses, but we consider that they ought not to go beyond the principles outlined in the previous paragraph. We recognise that the trade prices (i.e. manufacturers' basic selling prices) for lamps of the same type supplied by different manufacturers would probably for the most part still be the same, through the action of competition itself. It is also possible that the manufacturers might adopt similar scales of discounts. But provided that the discounts were based on the principles which we have outlined the actual net selling prices to individual buyers would no longer be uniform except where uniform prices were justified by the value or cost of the business.

83. It would also follow, if uniform scales of discounts based on quantity were in practice to be adopted, that the manufacturers might still submit identical bids in public tenders. Public authorities have expressed concern to us about the lack of competition in tenders and, as we have said in paragraph 59, we consider that in principle such bids, when made, ought to be related to the particular order. We cannot, however, suggest any practicable way of compelling the manufacturers to do this. To some extent public authorities can avoid level tenders by taking second brands in the case of GLS lamps or by getting competitive quotations from wholesalers, but we think it is desirable that the manufacturers also, if they respond to invitations to public tender with main brands, should do so on a genuinely competitive basis. They already do this for the Government and GLC contracts and a few others, and we hope that they will extend the practice more widely. They might be encouraged to do so if public authorities inviting tenders were to indicate the quantitites required, either in total or per consignment (see paragraph 80).

84. Finally, we recommend that all exchange of information between lamp manufacturers concerning prices, discounts and related trading arrangements should cease. This means that ELIC should no longer collect, assemble and disseminate (i) information about buyers of lamps, whether in the form of classes of buyers appropriate for different discount treatment or of lists of buyers within classes or in the form of information about the scale of purchase by individual buyers, and (ii) information supplied by individual members about discounts granted to particular buyers. (Such exchange of information would in any case be pointless if our previous recommendations on discounts were adopted.) It also follows that discounts and other trading arrangements should not in future

be discussed between ELIC and the EWF. In addition, apart from the formal ELIC arrangements, lamp manufacturers should not notify their competitors of changes in prices or discounts, whether before or after such changes become effective.

85. In the light of the developments which have taken place during the course of our inquiry these recommendations are less drastic than they might have appeared when our reference was made. As we have recognised, there is price competition in the industry and it has been increasing, especially in the last year. But traditional attitudes in the industry and the practices to which we have referred have tended to retard in some respects the development of the full benefits of price competition.

Production

86. We turn now to competition between the principal manufacturers in respect of the quality and types of lamps produced. In this respect also, as in the case of price competition, there is a history of restriction. In its previous inquiry the Commission found that the ELMA rules provided that 'Lamps must be made to comply with specifications agreed to by ELMA and not to any other specifications'; that 'Members must not sell lamps deviating in any respect from the recognised ELMA standard'; and that 'Advertisements must not indicate that any individual make of Association lamp possesses any advantage over or is better than another'. ELMA members therefore forewent any competitive advantage that they might have secured over other members not only by competing in price, but also by developing different types of lamps, by new discoveries or by superior manufacturing methods. All members were selling practically identical lamps at a common price, and competition in practice was confined to advertising and salesmanship.

87. There is also an early history of specific restriction of lamp life. One of the first actions of the Phoebus Organisation in 1925 had been to lay down a standard life of 1,000 hours for GLS lamps; it was provided that no mention of long life should be made in advertisements, and after 1929 there were fines for a life in excess of 1,500 hours and, on a lower scale, for a life shorter than 800 hours. No fines were in fact ever incurred by British manufacturers, and the scheme did not survive the war. A 1,000-hour standard had been in existence in this country even before the cartel introduced its system of fines for excessive life and in the 1950 inquiry the Commission were advised by the BSI that there could be no absolutely right life for the varying circumstances of different consumers and that 1,000 hours appeared the best compromise. The Commission, however, considered that the ELMA members showed a somewhat arbitrary attitude in refusing to market a type of lamp with a longer life in order to test whether the public in fact liked it. In view of the technical difficulties, the Commission considered that the question was best left to the BSI, but emphasised the need for effective representation of consumer interests on that body (see paragraph 169). We deal with the present position on long life in paragraphs 94 to 101.

88. An ELMA rule was still in force in 1950 restricting the life of Type B GLS lamps to a maximum of 1,000 hours with fines for excess life and for exceeding the limit on luminous efficiency. Type B lamps had been introduced in 1935 in order to compete with cheap imported GLS lamps and the products of independent manufacturers, and there was also a rule that each member's sales of Type B

lamps were not to exceed 25 per cent of his sales of higher priced lamps. The restrictions on Type B lamps were terminated in accordance with the Commission's recommendation in the 1951 report, but the collective regulation of the range of lamps produced continued until ELMA was dissolved in 1957. The rules of ELIC did not include any corresponding restriction, but in 1959 an agreement was made between ELIC members to give six weeks', later extended to four months', advance notification of the marketing of new types, and this is still in operation. The object of it is said to be to ensure 'mechanical and electrical interchangeability'. Details such as dimensions, performance and range of wattages of a new type of lamp are provided, as well as information about how it is proposed to introduce it, e.g., if it is to be test marketed, what area is to be used. The member concerned is debarred from giving any publicity to the new type of lamp until the four months have elapsed (see paragraph 182).

89. The manufacturers argue that this rule does not affect competition, since it does not provide sufficient time for any company to market a product which it had not already planned to introduce. They say that the four months' notification is concerned solely with standardisation of dimensions and ratings in order to avoid wasteful variations and to ensure interchangeability both of lamps and of fittings. Our examination of the records confirms that the discussion which takes place after notification under the four months' rule has this object. From what we were told it also appears that such notification would not usually entail divulging any technical information of which the other members were not already aware; there is a good deal of exchange of technical information in the sub-committees of ELIC and new developments would normally have been discussed long before notification was formally required under the agreement (see paragraph 188).

90. The four months' rule is, in effect, a formalisation of the general relationships between the ELIC members on these matters. Although there is no longer a rule that lamps may not be sold which do not conform to approved specifications, great importance is still attached to standardisation and much of the work of the technical committees of ELIC is devoted to this object, partly in conjunction with the BSI and international bodies concerned with standardisation, and partly on ELIC's own initiative going beyond the fields covered by other bodies. Attention is also devoted in ELIC to variety reduction; members' representatives meeting in sub-committees review their ranges of lamps and take steps to eliminate particular lamps for which public demand is low. An example of this was the attempt to eliminate the 75-watt size of GLS lamp from all the main brands (see paragraph 181).

91. The outcome of activities such as these is that, as under ELMA, ELIC members produce lamps which are not only interchangeable but identical in performance; moreover the range of lamps which each manufacturer offers for sale in its catalogue is substantially the same. (This depends partly on the practice of inter-trading discussed in paragraphs 75 and 76.) To this extent the principal manufacturers still forfeit some degree of competitive advantage from new discoveries or the development of different types of lamp, and we therefore conclude that the conditions to which the Act applies prevail because at least one-third of the supply of lamps of each of the descriptions referred to us is supplied by two or more persons who so conduct their respective affairs as to restrict competition in that the members of ELIC disclose to each other the details of new types of reference lamps in advance of marketing them.

92. The risk with such elimination of competition in respect of quality and performance is that the lamps provided to the public might be of a lower standard than would otherwise be possible, and that there might be insufficient incentive to innovation. We have, however, found no evidence that this has in fact occurred. Especially in respect of discharge lamps, there have been substantial improvements in performance over the years, and we have had no complaints from dissatisfied customers. There is no suggestion that British lamp manufacturers are not keeping fully abreast of international developments; although in part this results from the information reaching them under their agreements with foreign lamp manufacturers, the foreign partners have also benefited from some developments originating in this country.

93. Neither is there any evidence that standardisation and variety reduction have been carried too far. It is generally accepted that the standardisation of lamp dimensions and ratings is beneficial to users and much of it is, of course, carried out under the auspices of the BSI, on which the larger lamp users are well represented. The elimination of types of lamps which have been regularly produced in the past could cause inconvenience, but we have no evidence that it has done so; the number of varieties of lamps produced by each manufacturer has in fact been constantly on the increase, and, since this adds to the amount of stocks that have to be carried by distributors, it would clearly be wasteful to continue to produce types for which there was little demand. Moreover new designs have from time to time been introduced by one manufacturer alone in order to get a sales advantage, as when the mushroom-shaped lamp was introduced in the Mazda brand.

94. The only case we have met of a lamp for which there might be a substantial demand which is not being met is that of the long-life GLS lamp. Other lamps have proliferated but, although each of the principal manufacturers (generally through a subsidiary) produces a long-life filament lamp (see paragraph 203), these are supplied only to a few industrial and commercial users who particularly ask for them and they are not promoted through the normal channels of supply to the domestic consumer. The lamps generally available to such consumers are still made to the 1,000-hour specification, and the only way in which they can secure longer life is to underrun a higher voltage lamp.*

95. BLI has set out at length for us the technical considerations relating to lamp life (see appendix 7). The essence of the argument is that in filament lamps longer life can readily be produced by using the appropriate design of filament but only at the expense of a reduction in light output for a given wattage. Thus to obtain the same total light output with long-life lamps more lamps have to be used in a given installation and the consumption of current is greater. The cost of providing a given amount of light for a given length of time includes not only the cost of the lamps themselves but also that of the current consumed, and the latter is normally much larger than the former. The lamp life to produce the minimum cost of light therefore varies according to the cost of electricity, and the theoretical ideal life greatly exceeds 1,000 hours only if electricity is very cheap, as for example in Norway, where lamps made to the international 2,500-hour specification are general (and are supplied by British manufacturers). The only other circumstance which, the manufacturers say, may make long-life lamps desirable and economic

*A 250-volt lamp used on a 240-volt electricity supply is in effect a long-life lamp, although it gives a 15 per cent lower light output than a corresponding 240-volt lamp (see paragraph 16, footnote).

is if their situation makes replacement either difficult or expensive, as it is in and at coal-mines.

96. There can be no dispute with this technical argument, once its premises are accepted. But the assumption is that the sole object for all consumers in choosing lamps is to get a given amount of light at the lowest cost. We do not accept that this assumption is necessarily valid in all cases. Many consumers are not concerned to obtain a certain amount of light within narrow limits; they make no calculation of the amount of light output required to illuminate a particular room and of the size of lamp needed to achieve it; as the 1951 report pointed out, they are frequently happy to use shades or fittings which absorb much of the light output. This last tendency has no doubt increased with the introduction of television into every home. The need to replace a failed lamp can be a nuisance even in private homes if the lamp is in an awkward position such as a stair well, and it is in general more troublesome to some (for example the elderly or infirm) than to others. For all these reasons, we think that some consumers would prefer, if they were offered the choice, to have some or all of their lamps with a longer life than 1,000 hours, even at the cost of a lower light output. This we think would apply even if the price was somewhat higher; the cost of manufacturing is in fact very little more but there would of course be additional promotion and distribution costs. Our assumption that there is a demand for longer life lamps is supported by the inquiries we have made which show that there is a considerable demand for 250-volt lamps, to the extent that about 20 per cent of the main-brand GLS lamps supplied by the three largest manufacturers are in this voltage, although there is a 250-volt electricity supply only in two small areas of Sheppey which have no more than 5,500 connections. We have been told by some customers that their reason for ordering 250-volt lamps has been to secure longer life, in come cases because voltage fluctuations lead to excessively short life with standard 240-volt lamps.

97. We have been particularly impressed by the evidence provided by the NCB about its development, with the co-operation of Crompton, of a specification for a 2,000-hour GLS lamp in order to provide longer life with an acceptable light output. The satisfactory performance and the savings in lamp costs and maintenance have been such that the NCB has adopted the 2,000-hour lamp for general use not only in mines but throughout its offices, and we understand that several manufacturers are now willing to quote to the NCB for the lamps (see paragraph 439). BR has been buying lamps to this specification from Crompton and Kingston for use in three of its divisions, and now intends to extend their use to all its six divisions (see paragraph 444). Thus there is now available in production a lamp which provides twice the standard life with a light output which is lower only by an indistinguishable amount. No attempt, however, appears to have been made to promote the general sale of these lamps or of other long-life lamps in current production made to the international 2,500-hour or other specifications. Crompton told us that in 1962 it offered the NCB lamps not only to large users but also to wholesalers, who had shown no interest. In the absence of any advertising to the public, the reaction of the wholesalers is not surprising. No other attempt has been made at test marketing, to find out whether the ordinary trade and domestic consumer would be interested in such a lamp.

98. The manufacturers have argued that:

(i) Since the long-life lamp is less efficient than the 1,000-hour lamp it would be a retrograde step to encourage its use except in circumstances where lamp replacement is specially difficult or expensive; because the technical

considerations are complex the consumer would not realise that he was being sold an article which would cost him more in electricity.

(ii) Although there would be no great difficulty or expense in producing a range of long-life lamps, to do so would significantly increase the cost of distribution by duplicating the stocks of filament lamps carried by wholesalers and retailers.

(iii) The actual average life of standard filament lamps is substantially above 1,000 hours and this is a perfectly adequate life in normal circumstances; complaints arise only through premature failures, resulting either from occasional faulty lamps or from fluctuating electricity supply.

99. Some of these arguments would appear to apply also to the introduction of the mushroom shaped lamp; it must have added to stocks and so to distribution costs and its light output is less than that of the normal pear shaped lamp. The manufacturers argue, however, that the reduced light output of the mushroom shaped lamp is offset by the advantages of its more even diffusion of light.

100. As evidence of the fact that they have no inhibition about marketing long life as such, the manufacturers point out that they have been continually developing and marketing lamps with longer and longer life among the fluorescent and other discharge types (see appendix 8, table 3), as well as with the recent tungsten halogen lamp. There are however differences in the nature of the trade in such lamps. Fluorescent lamps, for example, have a market which is growing more rapidly than that of filament lamps, and furthermore the interest of the principal manufacturers lies at least as much in the fittings which accompany fluorescent lamps as in the lamps themselves. As compared with filament lamps, therefore, they are more interested in initial equipment in this field than in replacements and they stand to lose less if the replacement period is lengthened.

101. We have found no evidence that the manufacturers refrain from promoting long-life lamps as a measure of trade protection. The life of 1,000 hours is adopted for the GLS lamp by all makers in this country and it continues to be adopted by the BSI. We have ascertained, however, that ordinary domestic consumers have no more effective representation on the BSI now than they had when our predecessors made the comments on long life recorded in paragraph 87. As we have said in paragraph 96, we think that some domestic consumers might prefer the convenience of longer life (even at a higher price) to the maximum technical economy and efficiency of the 1,000-hour lamp, and we regret that they have not been offered the long-life lamp now in production for the NCB and other users. We hope that, in view of what we have said here, one or more makers may be prepared to re-examine the desirability of adding this product to the range of their lamps offered in the shops.

102. Our conclusion on competition between the principal manufacturers in respect of the quality and types of lamps produced may be summarised as follows. We have found that there is a great deal of exchange of information on technical matters especially through the activities of ELIC, and there is joint action in ELIC directed towards standardisation and variety reduction. As a result of these activities, and of the practice of inter-trading, all the manufacturers offer substantially the same range of lamps. We consider that some restriction of competition is involved, and we have therefore found that the conditions to which the Act applies prevail (paragraph 91). We have not, however, found that the prevalence of these conditions has done any harm. The principal manufacturers

are plainly not inhibited about seeking an advantage over their competitors by developing improved types of lamps, even though they may be prepared to allow their competitors to market the lamps which they have developed. Neither have we found that the range of lamps offered to the public has been unreasonably restricted. At the same time we recognise the value of the work on standardisation which is carried out in the technical committees of ELIC; this will be the main function of ELIC, if our recommendation that the exchange of commercial information should cease is accepted (paragraph 84), and in view of its value we consider that it would be beneficial for the membership of ELIC to be extended to include all lamp manufacturers, on financial terms which they can afford.

103. We conclude that the conditions which we have found to prevail because the members of ELIC disclose to each other the details of new types of reference lamps in advance of marketing them (paragraph 91) do not operate and may not be expected to operate against the public interest.

The Controlled Companies

104. We next consider the Controlled Companies (see paragraph 9), which are responsible for almost a half of the cheap lamp market, although their share of the total reference lamp market is only about 3 per cent. They are now something of an anachronism. They were set up or acquired before the war for the purpose of combating cheap lamp competition, especially from Japan, and of securing control of the cheap lamp market with the least injury to the higher priced brands (see paragraph 157). Already at the time of our predecessors' report they had ceased to be used in their intended role as fighting companies. There was at that time substantial competition from lamp manufacturers outside the ELMA ring. The Commission concluded that, if the ELMA members were to be left to carry on with agreed manufacturers' prices, it was important that the Controlled Companies should continue to provide a measure of competition as suppliers of cheap lamps. The Commission added that 'the preservation of the Controlled Companies as competitors would become even more important if ELMA or its members were to absorb any of the independent manufacturers' and recommended that the position of the companies should be reviewed if this happened or if they ceased to practise an independent price policy (1951 Report, paragraph 277).

105. Since then there has been a radical change in circumstances. With the growth of the cheap lamp market each of the shareholders has thought it desirable to participate in it directly, with the result that with the exception of one small company the cheap lamp manufacturers with which the Controlled Companies compete are now controlled by the shareholders themselves. From the point of view of the shareholders, therefore, the Controlled Companies' role has largely disappeared. This appears to have been recognised by the shareholders when they foresaw the ultimate closing down of the Controlled Companies if all the shareholders moved into the cheap lamp market (see paragraph 343). Moreover, collective price-fixing ceased in 1956 and the acquisition of independent manufacturers by the principal manufacturers has not, as we have shown in paragraph 47, led to a diminution in competition; our precedessors' reason for thinking that the preservation of the Controlled Companies might become particularly important in those circumstances has therefore not materialised.

106. The main safeguard for the public interest now, as we have pointed out in paragraph 49, is full competition between the leading manufacturers, and this

applies to the market for cheap lamps as well as to that for main brands. Although they are owned by the companies which are now their main competitors, the Controlled Companies, to the extent that their salesmen bid freely for business, still provide some additional degree of competition in the market. Their importance in the market has declined, however. We were told, for example, that a reduction in the prices to Woolworth in 1967 was the direct result of an attempt by Philips to win a share of this business; this suggests that the shareholders' own second brands may now be the pace-setters in the cheap lamp market. In these circumstances, although any additional competition they provide has some value, we doubt if the public interest would suffer materially if the Controlled Companies were to cease to supply reference lamps.

107. We accept that the Controlled Companies have in fact been permitted to follow an independent commercial policy and to sell as many lamps as they wished. We have seen evidence that the shareholders have on occasion taken some interest in particular commercial activities, but their motives appear to have been solely to ensure that unprofitable business was not undertaken, and not to divert competition from themselves (see paragraph 358). Indeed, until 1963 the companies were left very much to their own devices and, although representatives of the shareholders did meet occasionally to discuss the management of the companies, there was at that time no formal management committee and no records were kept. Even now the shareholders do not have access to details of the Controlled Companies' individual business deals. We have examined tenders submitted to a variety of public authorities, which show that the Controlled Companies regularly bid in competition with the shareholders' main and second brands, sometimes successfully and sometimes not, and there is no sign of any control of prices.

108. However, in one respect at least the Controlled Companies were not given their head during this period. One witness alleged that the Controlled Companies' production had been allowed to run down, that they had not been allowed to buy up-to-date equipment, and that they had been mulcted of their cash reserves. The shareholders themselves told us that the companies had frequently expressed a wish for more modern equipment but authority had not been given for investment before 1964. The lack of records before 1963 makes it difficult to discover what consideration was given to the Controlled Companies' needs at the time. The shareholders told us that because of the predominance of short runs in the Controlled Companies' 'multi-brand' business, and because they lacked sufficient technical expertise, more modern machinery would have brought no advantage to them; as long as the older machines continued to run satisfactorily, there was no point in replacing them. They also said that they had felt inhibited by the earlier criticism of the use of 'fighting companies'; new machines would have led to higher output and so to more aggressive selling, which might have attracted renewed criticism. Lack of funds was evidently not a difficulty, because the Controlled Companies had amassed substantial cash reserves. The refusals to allow re-equipment did not prevent the companies from earning profits until 1964 (see paragraph 340).

109. In 1963 and 1964 the shareholders deliberated over the need to reorganise and re-equip the Controlled Companies (see paragraphs 341–348). By this time some of their machinery was becoming increasingly expensive to maintain; the companies were facing sharp competition in cheap lamps from Thorn's subsidiaries, Omega and Astralec, and two of the shareholders (Philips and Crompton)

were also competing directly in the cheap lamp market. The Controlled Companies' management initially proposed a substantial modernisation and expansion of production, but a majority of the shareholders took the view that expansion was undesirable because they had ample capacity themselves. The direct participation of two of the shareholders (three, once the formation of BLI had brought Thorn in) in the market was a complicating factor and it was envisaged that if Osram and AEI were also to move into the market it would ultimately mean closing down the Controlled Companies. At the end of 1964 a compromise solution was reached. The Controlled Companies were reorganised under unified management, and production of GLS lamps was concentrated in a single factory on the basis of a reduction of one-third in their total production capacity, the balance needed for their sales being made up by supplies from the shareholders' own factories. The intention was that most of the longer runs should be undertaken in shareholders' factories where the modern machinery would make them more economic, while short runs should be left to the Controlled Companies' factory. Initially lamps were supplied by the shareholders at a price agreed between them and, also by agreement, in quantities proportionate to their individual shareholdings, an arrangement which, BLI told us, they subsequently realised might be technically registrable under the 1956 Act (see paragraph 217).

110. In view of the control exercised by the shareholders over investment and the substantial reduction in productive capacity which they imposed as a part of the reorganisation, it cannot be said that the Controlled Companies have been allowed complete freedom of action. However, we have to consider what effect that control has on the supply of lamps to the market and whether any restriction of competition is involved. It has to be considered in conjunction with the accompanying arrangement for the supply of lamps by the shareholders themselves for resale. At present about one-third of the Controlled Companies' sales are lamps produced and supplied to them by the shareholders. We were told that the prices and quantities of the lamps supplied in this way are no longer fixed by agreement between the shareholders, and that BLI set new prices in 1967 without prior agreement. With one temporary exception, however, the same prices were then applied to the other shareholders' supplies and the quantities supplied are still roughly in proportion to the shareholdings. In respect of these supplies the Controlled Companies are, in effect, acting as joint selling companies for the shareholders. In cheap lamps we now have the situation in which one part of the market is taken by the four leading manufacturers competing freely between themselves, but the other part, which is almost half, is taken by the Controlled Companies and the proceeds of this part of the trade are shared out between those four manufacturers in proportion to their shareholdings (proportions which, incidentally, echo the quotas fixed under the 1948 Lamp Agreement and the pre-war international cartel arrangements). We were told by one of the shareholders that, in considering whether the Controlled Companies ought to continue, it would weigh up not only whether it was getting sufficient profit on its investment but also, if the Controlled Companies disappeared, how much of their share of the cheap lamp market it could expect to capture with its own second brand in competition with the other shareholders. In other words, if it were not for the Controlled Companies, the four leading manufacturers would be in full competition for virtually the whole of the cheap lamp market, and if the Controlled Companies were to disappear the individual shareholders would not necessarily be faced with any less competition in the sale of cheap lamps.

111. Nevertheless we are satisfied that, in the circumstances which we have described, the shareholders' supply of lamps to the Controlled Companies for resale does not carry with it a restriction of competition, although it does affect the shareholders' relative shares of the market and of the profits derived from it. The important circumstances in this connection are, first, that the Controlled Companies are left entirely free of control by the shareholders in their selling, may sell as many lamps as they wish and in particular are free to compete with the shareholders' own second-brand lamps; and, secondly, that there is unrestricted competition between the shareholders' second brands themselves and this competition is probably now more important than that of the Controlled Companies in determining prices.

112. In these circumstances the supply of lamps by the shareholders for resale can be taken into account as a factor offsetting the effect on the Controlled Companies of the restriction of production imposed on them. The shareholders argued that the reorganisation was intended to strengthen the Controlled Companies, and that it would have been wasteful to have re-equipped them for a larger volume of production. The reorganisation is only now nearing completion and it is too soon to judge whether it will make the companies more or less competitive in costs than they might have been if they had been entirely free to run their own affairs. During the period of the reorganisation their production costs have naturally been high and they have made losses. They have certainly been assisted during this period by the supply of lamps by the shareholders at prices which were based on the Controlled Companies' production costs before the reorganisation started, prices which the Controlled Companies were unable to match during reorganisation. Whether supply by the shareholders will continue to be advantageous to the Controlled Companies, however, remains to be seen. The prices of these lamps were increased with effect from April 1967 (the new prices introduced by BLI and followed by the other shareholders) and, on the costings which we have seen, it appears possible that their own production might cost the Controlled Companies less than the supplies bought from the shareholders. On the other hand, although the arrangement is attractive to the shareholders because it provides additional loading for their machines and so helps to keep down their average production costs, we were told that it also had advantage for the Controlled Companies because they were enabled to keep their own machines fully occupied at all times while drawing on the shareholders for supplies to meet the fluctuating demand above this basic level. In other words, their own production costs would be higher if they were not getting some lamps from the shareholders. Taking this into account, we accept that the supplies by the shareholders may continue to strengthen the Controlled Companies' ability to supply lamps at competitive prices.

Components

113. The manufacture of electric lamps is largely a matter of assembly. Although lamp production is still divided between four principal manufacturers and several smaller ones, production of some of the main components of lamps, especially of filament lamps, is more concentrated (see paragraph 11). Most of the producers of these components are controlled by one or more of the principal lamp manufacturers, and the smaller lamp manufacturers, as well as any potential new entrants to the industry, must rely on these subsidiaries for supplies of essential components in order to be able to produce at competitive prices. For bulbs,

vitrited caps for filament lamps and bi-pin caps for fluorescent lamps there is only a single producer of each in the United Kingdom (Glass Bulbs, Lamp Caps and Lamp Presscaps). Two of these are controlled by GEC and BLI jointly and one by BLI alone. For the other principal glass components and wires there are two producers.

114. In the 1951 report, paragraph 267, the Commission recommended that 'ELMA members who sell components and materials should give an undertaking . . . that they will make them available equally to members and non-members at prices no higher, quantity for quantity, to non-members than to members, subject possibly to lower prices being charged to parent, subsidiary or fellow-subsidiary companies of the supplier'. Our inquiries into prices actually charged by the component companies do not suggest that there has been any infringement of the undertakings given. Nevertheless we are concerned that, even within the policy laid down by this recommendation, small independent manufacturers have to pay much higher prices for components than are paid by the large companies, especially BLI and Osram, and, since materials may represent as much as two-thirds of the factory cost of a lamp, this can represent a serious handicap, as we have already mentioned in paragraph 35. For example, in a comparison which we made of unit costs of production of a similar GLS lamp by the Controlled Companies and by one of the principal manufacturers, we found that the cost of materials was nearly a penny higher for the Controlled Companies (that is, a little over 4d. instead of a little over 3d. on a total factory cost of approximately 6d.), even though the Controlled Companies are allowed relatively favourable prices for some components; although the Controlled Companies had lower overheads and slightly lower direct labour costs, the total cost of their lamp was in consequence nearly a halfpenny higher than that of the large manufacturer's. If they had not had to pay more for components, their total production cost for the particular lamp examined would have been lower.

115. The pricing policy of Glass Bulbs shows how this distinction arises (see paragraph 378). Under its policy quantity rebates are given ranging up to 12½ per cent for quantities of 20 million a year and over; the Controlled Companies are charged list price less 17½ per cent regardless of quantity; Philips is charged cost plus 17½ per cent; and the two parent companies are charged cost plus 6 per cent. This can give rise to a very wide range of net prices. For example, in 1965 cost plus 6 per cent was equivalent, for the common pear shaped pearl bulb which accounts for nearly half of total bulb production, to a discount of 53½ per cent off list price, when Crompton, for example, was receiving only the maximum quantity rebate of 12½ per cent.

116. Lamp Caps similarly sells to its parent companies at cost plus 5 per cent. It publishes no price lists or discount schedules, but quotes prices to individual customers based on the potential volume of annual business, with no special terms for the Controlled Companies. The spread of prices is not so marked in this case, but for one common cap which we examined the highest price in 1965/66 was over 30 per cent above that paid by the parent companies. Before 1967 Lamp Presscaps was charging Osram a price for bi-pin caps about 18 per cent higher than the price to its parent, BLI. Following the transfer of its vitrited cap manufacture to Lamp Caps in January 1967, however, the price of bi-pin caps to Osram was reduced.

117. The differences in the prices which are charged for these components are not based on actual differences in costs in supplying different customers. The

quantity rebates are not related to the size of individual deliveries, but only to the total volume taken in a year. Since the components in question are standard articles with no special features for individual customers, the actual cost of manufacturing a bulb is the same for whatever customer it is produced and large orders do not produce economies in production. To some extent they may produce economies in distribution when bulk deliveries of a single type can be made, but these are not commensurate with the actual price differences. The parent companies told us that these differences were due to commercial considerations based primarily on the buying power of a particular customer. They argued that customers whose large orders contributed substantially to the volume needed for economies of scale to be achieved in production were entitled to lower prices.

118. These arguments might be acceptable if there were alternative suppliers, as there are in the case of Glass Tubes and Components and Lamp Metals, who have to sell in competition with Chance Bros. and Mullard respectively; indeed Lamp Metals is forced to quote uneconomic prices in order to be able to sell against Mullard. But this does not apply to the three companies which we have been discussing, each of which is the sole United Kingdom producer of certain components. We recognise that a limit is placed on the prices which they can charge by competition or potential competition from imports. Until recently, Glass Bulbs had the only mass production 'ribbon' machines in Europe, and about half its sales have been exports. A similar machine has recently been established in Belgium by NV Philips, however, and Glass Bulbs is likely not only to lose sales in Europe but possibly also to meet some competition in the United Kingdom. Similarly there is a powerful manufacturer of vitrited lamp caps (NV Vitrite, a subsidiary of NV Philips) in the Netherlands and it has made some sales of caps in the United Kingdom. In the case of bi-pin caps for fluorescent lamps the product is relatively simple and production could readily be established elsewhere if there was gross overcharging. Nevertheless we consider that the range of prices currently charged by the three component companies which have complete monopolies of production puts manufacturers other than the parent companies at a material disadvantage, and moreover constitutes an obstacle to any new entrants to the industry.

119. We conclude that the conditions to which the Act applies prevail because at least one-third of the supply of lamps of each of the descriptions referred to us is supplied by BLI and GEC who so conduct their respective affairs as to restrict competition in that they are owners or joint owners of companies which are the sole manufacturers of certain components for reference lamps and cause these manufacturers to discriminate between buyers in the prices charged for the components.

120. The parent companies have argued that because the investment in the component companies is theirs they are entitled to benefit by getting components at favourable prices. This argument may have been valid when the investment was first made, but in the circumstances of the electric lamps industry we think that it is now outweighed by the importance to the public interest of enabling small, independent lamp manufacturers to compete successfully. We therefore conclude that the conditions in question operate, and may be expected to operate, against the public interest.

121. By way of remedy we recommend, first, that the three companies concerned should charge for supplies to the parent companies on the same basis as they

charge to other customers. We recognise that it is common practice for components or materials to be transferred between two companies under common ownership at cost or an arbitrary price, but we see no objection to (and some advantage in) the alternative practice of transferring at arms' length prices, i.e. on the same terms as in sales to outside customers. It was put to us by one of the parent companies concerned that a change to arms' length prices would be no more than an accounting difference, since the additional price paid would be recovered in additional profits.

122. There are two reasons for rejecting this argument. The first is that it assumes that the change should be made by raising the price to parents and leaving the price to outside customers unchanged, but to do this might produce an excessive profit indicating that the previous prices to outside customers were too high. In the case of Glass Bulbs, for instance, the net profit of the Bulb Division as a percentage of net sales varied from 12·5 to 19·6 per cent during the years 1961/65; the return on capital for the company as a whole was reduced in some years by losses in the Pressings Division (which is not concerned with reference lamps), but it rose as high as 23·4 per cent in 1965. In this instance, therefore, we would expect that some reduction in prices to outside customers might be appropriate.

123. The second reason for rejecting the argument is that, although any increased profit would be recovered by the parent company as a whole, it would not necessarily be used directly to offset manufacturing costs in the production of lamps using the components in question. The parent companies appear to be guided by this consideration when it operates in the opposite direction; in the case of Lamp Metals, for example, actual production costs are higher than the prices charged by Mullard and, although BLI ultimately has to meet its share of this higher cost, the components are nevertheless initially transferred at prices identical with Mullard's, in order that within the BLI organisation the manufacturing departments should not be penalised by having to buy materials at more than the open market prices. We consider that this principle is applicable both ways, and that the parent companies should pay open market prices in every case.

124. Secondly, we recommend that the range of quantity terms given by Glass Bulbs, Lamp Caps and Lamp Presscaps should be only such as can be justified by actual variations in costs; whatever scales of quantity discounts or rebates they propose to apply should be submitted, together with evidence of cost justification, to the Board of Trade for approval. We consider that these two changes should materially help to make small lamp producers, including the Controlled Companies, more competitive.

The merger of vitrited lamp caps production

125. The transfer of production of vitrited lamp caps from Lamp Presscaps to Lamp Caps, which has already been referred to in paragraph 116, took place during the course of our inquiry. In a letter dated 6th March 1967 the Board of Trade expressed the hope that, during our examination of the supply of electric lamps, we would take account of the new situation created by this merger.

126. The occasion for the transfer was the lack of space for expansion at Lamp Presscaps' factory, where the production of vitrited caps, of bi-pin caps and of other (non-lamp) components were all growing. There were difficulties about moving the production of bi-pin caps or of the other components away from London, and we were told that the alternative to the transfer to Lamp Caps' factory

was to build a new factory for vitrited caps on a new site. The transfer would therefore economise in the use of capital and also give a better chance of preserving skills. With the combined load of the two original companies Lamp Caps expected to be able to introduce more efficient production methods and thus to reduce production costs. This would put the company in a better position to compete with continental manufacturers, whose load would still be considerably higher, and to survive if Britain should enter the European Economic Community. The first objective would be to avoid price increases which would otherwise become necessary because of the rise in materials prices.

127. The transfer of plant from Lamp Presscaps has made some rearrangement and new building necessary at the Lamp Caps' factory, and it was estimated that the total expenditure incurred by Lamp Caps for complete integration of production over a three-year period would be £651,000, of which about £275,000 was for the acquisition of assets (including work in progress and stocks) from Lamp Presscaps. It was also estimated that, because of more efficient production methods possible with the larger volume, after four years total returns to Lamp Caps for the same (combined) production would have increased by £148,000, assuming unchanged materials costs and selling prices (against which Lamp Presscaps would lose profits estimated at £250,000 over 10 years). A revision of the expected returns at May 1968 levels of costs and prices has since reduced the estimated increase in returns from £148,000 to £86,000.

128. Lamp Caps has given us its original profit forecasts, at the level of costs and prices prevailing in early 1967, for the first full year after the start of the merger (1967/68) and for the first full year after complete integration should have been achieved (1969/70). We have also been given the actual results achieved in 1967/68 and a revised estimate for 1969/70 at the levels of costs and prices prevailing in May 1968. These results and forecasts, as well as Lamp Caps' trading results for the last two years before the merger, are summarised in paragraphs 523 and 524.

129. We received several complaints and adverse comments from certain lamp manufacturers about the transfer of production (see paragraphs 370–377). One company complained that it had been forced to import caps because of a shortage following the transfer; Lamp Caps explained that this was due partly to the upheaval involved in the transfer itself and also to an unexpected temporary surge in demand. Lamp Caps itself had imported caps from the Netherlands in order to meet customers' demands, and had given no priority in supply to the parent companies. We accept that this was a temporary situation and that there is no reason to expect that Lamp Caps' capacity will be inadequate in future.

130. Another company complained that the two cap manufacturing companies had, even before the merger, been charging level prices and that these prices had risen unreasonably. We were satisfied upon investigation, however, that the price increases which had taken place were due in large measure to increases in the cost of brass strip.

131. In general, some disquiet was expressed about the complete monopoly which the transfer has created, and the lack of a practicable alternative source of supply. Lamp Caps emphasised the competition provided by imports, and we accept that imports are possible and some do take place; but the British type of bayonet cap is a non-standard line for foreign manufacturers and, taking into account the import duty and cost of carriage, they are unable to match British

prices. Competition is ineffective, therefore, and because of this there is no automatic assurance that any benefits of the transfer will be passed on to outside customers. We accept that the cost reductions expected to arise from the transfer will, if they are achieved, be valuable, but we think it important that the benefit should not be confined to the parent companies.

132. The parent companies gave the Board of Trade an assurance that the price policy of Lamp Caps would not be changed following the transfer. We have concluded, however, that this price policy, when applied by companies with a complete monopoly, operates against the public interest (see paragraphs 119 and 120). In the case of Lamp Caps the effect of this policy is likely to be that, if unit costs fall, the immediate benefit will be pre-empted by the parent companies because they take caps on a cost plus basis. The profit made on sales to outside customers would rise, and it is likely that a reduction in prices to outside customers would be considered only if the total profit on all sales of lamp caps rose substantially, by which time the profit on outside sales could have reached a very high level. If the parent companies were subject to the same terms as outside customers, on the other hand, the need to reduce prices to all customers would become apparent. Consideration of this transfer of production, therefore, reinforces the need for the recommendations which we have made in paragraphs 121 and 124.

BLI's monopoly position

133. We next return to consider the effect on the public interest of the conditions which we found to prevail because BLI supplies at least one-third of the lamps covered by the reference (paragraph 24). This statutory monopoly position was brought about by the formation of BLI in June 1964 through the merger of the lamp and lighting interests of Thorn and AEI. We have therefore sought to identify, as far as practicable, the benefits which have flowed from that merger.

134. The process of integrating and reorganising the lamp and lighting interests of the two companies is still not complete. During the first year after the merger the management of BLI concentrated on reorganising lamp production (see paragraph 218). Two of the eleven lamp factories were closed completely, and various lamp production units were transferred from one factory to another in order to concentrate production by types of lamp and so get the advantage of longer runs and higher loading. A third factory was closed in 1967. Some additional cost savings accrued in manufacture because Thorn, for the first time, was able to buy components from the jointly-owned component companies at the special parents' prices.

135. Reorganisation in sales and distribution has been proceeding more gradually (see paragraphs 226 and 227). In distribution all operations have been brought under a single control and the number of regional warehouses is in process of being reduced from the 41 which existed at the time of the merger to nine, which will be new warehouses with more modern equipment. We were told that it had been estimated that this programme would ultimately produce savings of over £1 million a year, and that it would have been difficult for either Thorn or AEI to undertake such reorganisation if they had remained separate. A central commercial headquarters has been established to provide services which were previously carried out separately by the three main-brand selling organisations (Atlas, Mazda and Ekco-Ensign).

136. Other economies have been achieved through the centralisation of administration and also through the reorganisation of research and development, although in this respect the intention has been to achieve more effective research rather than to reduce expenditure.

137. It is difficult to assess the total cost savings which have so far been made possible by the merger. An examination made in February 1967 showed identifiable savings of yearly fixed costs, mainly through closures, amounting to over £400,000. For several reasons it is difficult to quantify the various other savings; the accounting methods of the two companies before the merger were different, making comparison difficult, and the picture is complicated by changes which have been taking place in the costs of materials and of wages. There was also a substantial increase in the total volume of production between 1964 and 1966, which reduced unit production costs but may not necessarily have resulted from the merger. However, we consider that the total savings brought about by the merger so far, including non-reference as well as reference business, may have been of the order of £1 million a year, which can be compared with total annual costs in the region of £30 million a year.

138. In some respects it is possible that cost savings would have been achieved even without the merger. Philips, for example, told us of substantial economies which it had made in the last few years in selling, distribution and administration through closing depots, reducing staff in the commercial department, introducing more efficient stock control, and so on. It is possible that under the pressure of competition Thorn and AEI separately might also have been able to achieve something of this kind. Nevertheless, we are satisfied that a substantial part of the savings which have been achieved or are expected has become possible only through the merger. BLI emphasised the importance of the fact that the management of the merged company was supplied by Thorn, and we accept that this is material. Thorn was a late entrant to the industry and had built up a substantial stake in it largely, we were told, through the attention which it had paid to costs and marketing and its readiness to invest in high production machinery and to seek exports in order to load such plant economically. AEI on the other hand, although still occupying a leading position as a producer of lamps, had not in recent years been making a commercial success of this business. In many respects the two companies were complementary (Thorn strongest in fluorescent lamps and in fittings, AEI in discharge and filament lamps) and it was to be expected that the application of Thorn's management methods to the whole group would produce greater efficiency.

139. To some extent it is possible to see the results of this in the record of the sales and profit figures, although these are also affected by a variety of other factors. In the following table we summarise the results of reference trading (that is to say, sales in the United Kingdom of lamps covered by the reference) for BLI for the last three financial years, together with those of AEI and Thorn for their last complete financial years before the merger. We also include, for comparison, two years' results for Osram and Philips. The figures are on the historic cost basis except where otherwise stated.

140. These figures show that AEI's profit on sales and return on capital were much lower than those of Thorn, but that in the second year after the merger the total return on capital for BLI had already been brought up to Thorn's pre-merger level. There was also a marked increase in sales in that year compared with the total sales of the two companies separately before the merger. Sales fell

	Net Sales (£'000)			Profit (£'000)			Profit on Sales (%)			Return on Capital (%)		
	Total	filament	discharge	Total	filament	discharge	Total	filament	discharge	Total	filament	discharge
AEI												
Year ended 31st December 1963	4,045	2,636	1,409	113	12	101	2·8	0·5	7·2	3·6	0·6	9·8
Thorn												
Year ended 31st March 1964	4,846	2,619	2,227	618	357	261	12·7	13·6	11·7	13·6	15·6	11·7
BLI												
Ten months ended 31st March 1965	8,788	5,117	3,671	857	469	388	9·7	9·2	10·6	11·0	10·2	12·0
										(annual equivalent)		
Year ended 31st March 1966	11,381	6,475	4,906	1,148	472	676	10·1	7·3	13·8	13·6	9·5	19·4
Year ended 31st March 1967	11,138	6,232	4,906	1,076	317	759	9·7	5·1	15·5	11·8	5·9	20·0
Osram												
Year ended 31st March 1966	4,898	3,277	1,621	614	348	266	12·5	10·6	16·4	21·9	20·0	25·1
Year ended 31st March 1967	5,205	3,431	1,774	573	373	200	11·0	10·9	11·3	17·9	18·8	16·5
Philips*												
Year ended 31st December 1965	4,724	2,023	2,701	491	91	400	10·4	4·5	14·8	20·2	8·0	31·1
Year ended 31st December 1966	5,229	2,149	3,080	376	68	308	7·2	3·1	10·0	13·4	5·6	19·2

*Philips' fixed assets are included in capital at its revaluations less depreciation.

slightly in the following year, however, the fall being concentrated on filament lamps, and this reduced the total profit rate (because manufacturing and selling capacity were geared to an expected higher level of sales).

141. The comparison with the results of Osram and Philips suggests that, although the merger has had the effect of raising the previously unsatisfactory results of AEI to a more satisfactory, although still modest, level for the combined company, it has not enabled BLI, so far, to achieve better results than its main competitors. Both of these companies succeeded in increasing their sales both of filament and discharge lamps between the two years shown, when BLI's sales fell in filament lamps and remained static in discharge lamps. The rate of profit on sales is roughly comparable for all three companies, except that Osram shows a higher rate than the other two companies on filament lamp sales. Both Osram and Philips show a higher return on capital than BLI, Osram particularly with filament lamps and Philips with discharge lamps. It is difficult to isolate all the factors which account for these differences, but among the more important are the following:

(i) Osram's factories are relatively old, so that its fixed capital in relation to sales is low and its return on capital high.

(ii) A substantial proportion of Philips' sales are of lamps imported from its parent company in the Netherlands, so that its fixed capital is also low in relation to sales and its return on capital correspondingly high.

(iii) In filament lamps BLI does a relatively high volume of second-brand business, which is less profitable than sales of main-brand lamps. This reflects the difficulty which Thorn experienced in entering the main-brand market (see paragraph 38); before the merger, about 40 per cent of Thorn's total sales of domestic-type GLS lamps was accounted for by the Woolworth trade alone, and this still amounts to over 20 per cent of BLI's domestic-type GLS lamp sales. BLI, like AEI before it, has also regularly won a substantial part of the main contract for supplying lamps to the Government, and has offered very low prices to do so.

142. Although this comparison appears to show BLI's performance in a relatively unfavourable light, this is misleading unless account is also taken of exports, which are not covered by the terms of our reference. We were told that the cost savings derived from the merger had not been passed on to consumers in the United Kingdom in the form of lower prices (although they had helped to avoid price increases), but they had been used to reduce prices in export markets and so to increase total trade, as shown by the following table:

	Filament Lamps		
	Total exports (*millions*)	BLI exports (*millions*)	BLI share %
Year ended 31st March 1965	26·277	13·253	50·3
Year ended 31st March 1966	30·144	15·539	51·6
Year ended 31st March 1967	25·175	16·974	67·4

	Fluorescent Lamps		
	Total exports (*millions*)	BLI exports (*millions*)	BLI share %
Year ended 31st March 1965	9·765	9·449	96·7
Year ended 31st March 1966	13·274	12·489	94·1
Year ended 31st March 1967	14·190	14·187	100

	Discharge Lamps*		
	Total exports (*thousands*)	BLI exports (*thousands*)	BLI share %
Year ended 31st March 1965	1,156	167	14
Year ended 31st March 1966	748	259	35
Year ended 31st March 1967	537	272	51

*The figures of total exports are derived from Board of Trade statistics and for these purposes discharge lamps are grouped under a heading 'Discharge lamps, luminous tubes and tube signs other than fluorescent'.

Thus BLI has achieved a substantial increase in exports since its formation at a time when exports by other manufacturers have fallen; the increase was particularly marked in lamps sold under the former AEI brand. This is a striking benefit to the public interest which has resulted from the merger.

143. We have discussed benefits resulting from the creation of BLI. We do not think there have been any adverse consequences. Competition in the supply of electric lamps has increased over the last ten years or so and we are satisfied that it has been increasingly effective in holding prices down and in forcing the manufacturers to strive for greater efficiency. This competition is the principal safeguard for the public interest, and the various recommendations which we have made earlier are designed to strengthen it and ensure its continuance. We do not consider that the creation of BLI has reduced this competition; indeed, to the extent that the former AEI share of sales has been made more efficient, competition is likely to have been enhanced. Moreover the management of BLI has shown a disposition to break away from traditional attitudes and practices in the industry; where it has been in a position to lead, its influence has been beneficial and in the direction of a more competitive approach. The mere fact of the creation of BLI and the threat which it implied has probably hastened the breakdown of former uncompetitive attitudes. BLI is not in a position to dominate the market; although it has a substantially larger share of the total supply of lamps, both Philips and Osram are formidable competitors and both of them succeeded in increasing their sales at the expense of BLI in the last year, while achieving profits at least as good as those of BLI. Moreover both of them belong to powerful groups with ample resources to meet any challenge to their position in the market. The disappearance of either of them as a separate supplier of lamps would, of course, radically alter the structure of the industry, and our conclusions assume their continuance.

144. Monopoly may give rise to inadequate capacity, excessive prices either resulting from inefficiency or associated with excessive profits, and lack of technical progress. BLI shows no sign of any of these. If anything, it has had surplus capacity recently and it could certainly expect to lose trade to its competitors if ever its capacity was insufficient. As regards prices, BLI has said that it is the price leader and this appeared to be true when changes introduced by BLI were rapidly followed by its competitors; but Philips' introduction of a radically different discount structure in March 1968 shows that BLI's position as price leader is now being challenged. We have made recommendations relating to the danger of price competition being restricted by the oligopoly structure of the industry and, apart from this, we are satisfied that BLI is not in a position to charge 'monopoly prices' provided that there is full competition between the three leading manufacturers. BLI's profits have certainly not been excessive so

far, and have indeed been at lower rates than those of Philips and Osram. Finally, as regards research and development, BLI has not sought to cut back expenditure and its reputation for technical innovation is good. We accept that no loss of technical know-how available to the industry has resulted from the formation of BLI (see paragraph 613).

145. We conclude, therefore, that the conditions which we have found to prevail because at least one-third by value of the lamps covered by the reference supplied in the United Kingdom are supplied by BLI do not operate against the public interest and may be expected not to do so.

Summary of conclusions and recommendations

146. The structure of the electric lamp industry has changed in important respects since the Commission previously reported on it in 1951, and in recent years it has become noticeably more competitive, with benefit to the public interest. The growth of competition and the development of more efficient methods in distribution have been delayed by arrangements and attitudes of mind which have survived from the various restrictive practices prevalent in the days of ELMA, but the movement away from traditional practices has accelerated during the course of our inquiry. Although BLI now has a monopoly share of the trade, as defined in the 1948 Act, we have seen the main danger to the public interest arising from oligopoly and the main safeguard for the public interest therefore lying in full competition between the leading manufacturers. We have found some restrictions of competition between them still existing, although of declining importance, and we have made recommendations designed to hasten their removal. In other respects we consider that the performance of the electric lamp industry is satisfactory; its technical reputation has always been good, its prices are reasonable by international standards and BLI has recently been successful in export markets, and an improvement in the efficiency of distribution now appears to be in process.

147. Our detailed conclusions and recommendations may be summarised as follows:

(1) We have found that the conditions to which the 1948 Act applies prevail as respects the supply of the lamps covered by the reference

(i) because at least one-third by value is supplied by BLI (paragraph 24);

(ii) because at least one-third is supplied by manufacturers who (a) recommend or otherwise suggest the resale prices of the bulk of the reference lamps they sell and the distributors generally follow the recommendations; (b) relate prices for individual buyers to the buyer's total purchases from all suppliers; (c) by arrangement exchange information through ELIC about the total purchases of wholesaler and user buyers and about discounts granted to such buyers, and generally inform each other of changes in prices or discounts (paragraph 78);

(iii) because at least one-third is supplied by members of ELIC who disclose to each other the details of new types of reference lamps in in advance of marketing them (paragraph 91);

(iv) because at least one-third is supplied by BLI and GEC who are owners or joint owners of companies which are the sole manufacturers of certain components for reference lamps and cause these manufacturers to discriminate between buyers in the prices charged for the components (paragraph 119).

(2) The conditions which prevail by virtue of BLI's share of the market (subparagraph (i) above) and by virtue of the exchange of technical information between the members of ELIC (subparagraph (iii) above) do not operate against the public interest and may be expected not to do so (paragraphs 145 and 103).

(3) The conditions which prevail by virtue of practices restrictive of price competition (subparagraphs (ii) (a), (b) and (c) above) and of discrimination in the prices charged for components (subparagraph (iv) above) operate and may be expected to operate against the public interest (paragraphs 79 and 120).

(4) By way of remedies for the matters which we have found to operate against the public interest we recommend that:

(i) lamp manufacturers should no longer recommend resale prices for electric lamps, nor should they use lists of retail prices as a basis for trading (paragraph 80);

(ii) in their standard terms lamp manufacturers should no longer base any of their standard discounts on buyers' total purchases from all sources or other assessment of total purchasing potential (paragraph 81);

(iii) all exchange of information between lamp manufacturers concerning prices, discounts and related trading arrangements should cease (paragraph 84);

(iv) Glass Bulbs, Lamp Caps and Lamp Presscaps should charge for supplies of lamp components to their parent companies on the same basis as they charge for supplies to other customers (paragraph 121); the range of quantity terms given by these component manufacturers should be only such as can be justified by actual variations in costs; whatever scales of quantity discounts or rebates they propose to apply should be submitted, together with evidence of cost justification to the Board of Trade for approval (paragraph 124).

148. Although we have made no formal recommendations in these respects, we have also expressed the hope that the main-brand manufacturers should, when they respond to invitations to public tender, submit genuinely competitive bids more widely than they do at present (paragraph 83); that one or more manufacturers should re-examine the desirability of adding a long-life lamp to the range of their lamps offered in the shops (paragraph 101); and that the membership of ELIC should be extended to include all lamp manufacturers, on financial terms which they can afford (paragraph 102).

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Electric Lamps

Second Report on the Supply of Electric Lamps

Part II

Presented to Parliament in pursuance of section 9 of the Monopolies and Restrictive Practices (Inquiry and Control) Act 1948

Ordered by The House of Commons *to be printed*
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* These members and Sir Laurence Watkinson, KBE, CB, MC, formed the group, under the chairmanship of Mr. A. H. Bruce, which was responsible for this enquiry. In view of his position as Chairman of the Parliamentary Committee of the Co-operative Union, Mr. L. A. Hurt took no part in the inquiry after 14th August 1966. Sir Laurence Watkinson retired from membership of the Commission in March 1968 and took no further part in the inquiry.

† *Note by the Board of Trade.* Mr. Bruce, Mr. Hurt, Dame Alix Meynell, Professor Sayers, and Mr. Silberston have ceased to be members of the Commission since the Report was signed.

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Appendix

CHAPTER 3

The 1951 Report

149. The electric lamps industry as it existed in this country some seventeen years ago was described very fully in the Commission's report of 1951 (see paragraph 12). As we have said, the report dealt primarily with the activities of ELMA, but it also traced the history of the industry from its earliest days and gave an account of certain international restrictive arrangements. The early international arrangements culminated in 1924 in the conclusion of comprehensive agreements between the world's leading lamp manufacturers which largely determined the subsequent activities of ELMA and the trading practices of some of its members; these agreements also set the pattern of certain of the activities of its successor associations and are reflected to some extent in certain features of the industry at the present time. We therefore consider it necessary for a proper understanding of the present position and its development to include in our report the following short summary of the main facts set out in the 1951 Report.

The Phoebus Organisation

150. A series of agreements between the leading American, German and British lamp manufacturers before 1914 provided for the cross-licensing of the then important patents relating to filament lamps and for exchanges of manufacturing information; they also provided protection from competition in the parties' respective home markets and other defined areas. Some of the arrangements provided for joint selling at fixed prices but these broke down in the face of strong competition from outside manufacturers. The world market for electric lamps expanded rapidly after the end of the 1914–18 war, with greatly increased production capacity, and it was said that competition became 'cut throat' and dumping not uncommon. Negotiations between the world's leading manufacturers led to the conclusion in 1925 of an international agreement between continental manufacturers, and a little later also brought in the leading British manufacturers. This agreement was known as the 'Phoebus Agreement' from the name of the company, SA Phoebus,* Geneva, which was set up to administer the organisation. The agreement had two acknowledged main functions—the exchange of patents and technical information, which was conditional upon adoption of common prices and terms, and the division of the world's markets in electric lamps. In pursuance of these functions the parties agreed, inter alia, to preserve the existing pattern of trade by the allocation of percentage sales quotas to each party or local groups of parties based on past trading figures; not to oppose each other's patents; and to prohibit assistance to non-member manufacturers, including a policy of prohibiting or limiting the supply of components to non-members. A central Sales Committee was set up to decide general sales policy and lay down principles for the determination of prices, terms and conditions of sale for the information of local groups which, in turn, were required, after conferring with the local distributive trade, to fix the price schedules and terms and conditions of sale for their areas. Outside manufacturers could be acquired only for the joint account of the

*SA Phoebus ceased to operate in 1939 but due to lengthy lawsuits was not wound up until 1963.

Phoebus members; the parties did, in fact, acquire a number of such businesses and sought to meet outside competition by producing lamps in these factories to sell under brand names which were different from their own and at prices which were lower than those of their own products. Special committees were formed to direct these 'fighting companies', one of which, NV Splendor, had a selling subsidiary, Splendor Lamp Co. Ltd., in this country (see paragraph 9).

151. One of the first actions of the Phoebus organisation was to lay down the upper limits on the life of lamps made by members, with penalties for excessive life or short life.* It was also laid down that no mention of 'long life' should be made in any advertisment, and the organisation opposed the introduction of any system of quality marking for lamps.

152. The American General Electric Company (General Electric) was not itself a party to the Phoebus Agreement, but it took a leading part in the preliminary negotiations through its subsidiary, International General Electric Company (IGEC), which acted as a holding company for General Electric's overseas interests. After the conclusion of the agreement, however, IGEC made separate agreements with most of the parties which provided for the exchange of patents and know-how, the preservation of the USA and Canada as the exclusive market of IGEC, the grant to the other parties of exclusive rights in their respective home markets and the mutual grant of non-exclusive rights in common markets. Some of the parties to the Phoebus Agreement made similar complementary agreements with one another.

153. The sales quota provisions of the Phoebus Agreement were elaborate; briefly, each party (or group of parties) was allocated a quota in his home territory and in certain common territories. At the end of each period of twelve months total sales of all the parties were calculated in units for each territory; each party's quota for each territory was then determined by applying his already specified local percentage to that total. Each party's quota was compared with his actual sales to determine excesses and deficits. For the purpose of these calculations, a schedule was drawn up and revised annually which converted the many different types and wattages of lamps into unit values. The calculations involved the examination and tabulation at Geneva of hundreds of thousands of individual invoices remitted by the parties. Penalties were paid by those whose sales exceeded their quotas and compensatory payments were made to those in deficit. The original British parties to the agreement were GEC, the AEI Group (BTH, Ediswan, Metrovick), Siemens (later absorbed into the AEI Group) and Cryselco (owned jointly by GEC and NV Philips†). These formed the 'British Group' which was allotted a joint quota based on the aggregate sales of the six members and was responsible under the agreement for controlling prices and terms in the United Kingdom. The British Group made its own arrangements for sharing the joint quota and for penalising or compensating those in excess or deficit.

154. Thus at the outbreak of war in 1939 the world's leading lamp manufacturers, apart from the Japanese, were associated in a tight network of agreements which effectively reserved home markets to home manufacturers, regulated competition

*No British manufacturer incurred fines for either short or excessive life.
†NV Philips did not at that time have a wholly owned British subsidiary: it later formed Philips Lamps Ltd. (now by change of name Philips Electrical Ltd.) and acquired Stella Lamp Co. Ltd., both of which joined ELMA in 1933.

in common markets and employed the ownership of patents to induce independent manufacturers to enter into similar contracts involving quota restrictions and observance of agreed prices. The Phoebus Agreement and certain of the complementary agreements between individual manufacturers were automatically cancelled by the outbreak of war in 1939.

The United Kingdom electric lamps industry to 1939

155. After the end of the 1914–18 war the members of two associations of British lamp manufacturers which had been concerned principally with patent licensing arrangements joined together to form the Electric Lamp Manufacturers' Association of Great Britain (not to be confused with ELMA), which fixed common prices and trade terms and operated a system of exclusive agreements with distributors. In 1933 the members of this association, with the two British subsidiaries of NV Philips (see paragraph 153, footnote) formed ELMA, which then took over and added to the existing arrangements. The ELMA system of strictly enforced maintenance at all stages of supply of a common price for every type of lamp manufactured to common minimum standards, enforced by collective sanctions of fines and stop lists, effectively prevented any form of price competition between members; and a system of exclusive dealing agreements with distributors and users, quantity rebates on the aggregate value of annual purchases of ELMA lamps, and payments of over-riding commisions to distributors' associations, was directed at preserving members' markets from competition from outsiders.

156. The ELMA rules also provided that members could not compete with each other by the production of new or different types of lamps without the consent of ELMA; and lamps were to be made to specifications agreed to by ELMA, which included BSI specifications, but not to any other specifications. At ELMA's request, BSI introduced a certification mark scheme for GLS lamps by which manufacturers could obtain a licence to apply the mark to their products as evidence of compliance with the relevant BSI standards. Most ELMA members applied for provisional licences but for a time they were undecided about the advantages of the scheme. On the one hand, it was thought that the scheme might encourage outsiders to improve the quality of their lamps and, should they obtain licences, the ELMA members would not then be able to say that outsiders' lamps were inferior; on the other hand, some important users had announced that they were prepared to buy only from licence holders. In the event, the ELMA members proceeded to obtain licences, but agreed amongst themselves not to apply the certification marks to their lamps unless any non-member also obtained a licence.

157. In the early 1930's GLS lamps, mainly imported from Japan, were retailed in chain stores and the like at 6d. or 1s. 0d.; the corresponding ELMA prices were 1s. 7d. or 1s. 9d. In 1935 the Phoebus organisation equipped Splendor (see paragraph 150) to manufacture cheap lamps in this country to compete with Japanese and other lamps sold by Woolworth at 6d.; commercial control rested with the appropriate Phoebus committee in consultation with the British Group, which was responsible for technical management. At about the same time, principally in response to representations about their high prices, the ELMA members introduced, in quantities which were to be limited, a lamp of lower quality than their main brands to be known as 'Type B', to be retailed at 1s. 0d. The life aimed

at was 900 hours with a maximum of 1,000 hours, and there was a system of fines for longer life and for luminous efficiency above a limit laid down. In the following year the principal members of ELMA, with the approval of the Phoebus organisation, jointly acquired the lamp-making interests of Ismay Industries Ltd. comprising, in effect, Britannia and Ismay (see paragraph 9). Britannia had been formed in the early 1930's to handle imports of Japanese lamps and had begun to manufacture in 1935, mainly for supply to Woolworth. At the time of its acquisition by the members of ELMA Britannia was the largest independent lamp manufacturer in the United Kingdom. These acquisitions originated the Controlled Companies, and it was recorded at the time that the ELMA members aimed to use them to supply the market for cheaper lamps, to control that market with the least injury to their own higher priced brands, and to use the companies, if required, as fighting companies.

158. In 1936 Aurora (see paragraph 12) joined ELMA as part of the settlement terms of a patent action brought by an ELMA member; the settlement imposed on Aurora a sales quota and adherence to the ELMA common prices, terms and conditions. In 1937 Crompton, which was then one of the only two independent manufacturers of any size in this country and which made both cheap lamps and lamps to sell at ELMA prices, joined ELMA and also became a party to the Phoebus agreement and the ELMA trading arrangements and was allotted a sales quota; these arrangements were part of the terms of an agreement which settled patent actions brought against Crompton by ELMA members. (The agreement was formally terminated in 1951.) By a patent licence agreement of 1937 with the members of ELMA, which had the prior approval of the Phoebus organisation, British Luma (see paragraph 9) was allotted a sales quota and undertook, inter alia, to observe ELMA's common prices and terms (except on sales to co-operative societies, which were however to maintain the common retail prices but were permitted to include lamps for dividend purposes) and not to supply lamp parts to manufacturers not approved by ELMA. Until 1948 British Luma was the only independent manufacturer to be granted a patent licence affecting lamps by members of ELMA.

The period 1939–1951

159. In 1941 the British Group of the Phoebus organisation, with NV Philips (then located outside Holland) and the IGEC Group, concluded an agreement which operated until 1948 and which substantially maintained the principal features of the Phoebus arrangements as between the signatories except in enemy-occupied and certain neutral territories. In 1945 the IGEC Group withdrew from the agreement for reasons understood to be connected with the American anti-trust laws. The agreement lasted until 1948 when a new agreement, known as the 1948 Lamp Agreement, was concluded to which only British manufacturers and NV Philips were parties.* The agreement applied sales quota arrangements to each of six territories, of which the United Kingdom was one and the others were all within the Commonwealth. The quota arrangements were generally similar to those operated under the Phoebus agreement; excesses and deficits were calculated on a similar basis of unit values, but penalties

*The agreement was due to expire on 30th June 1955. It was extended for four months from this date with certain modifications, and finally terminated on 31st October 1955.

for excesses were considerably reduced. In 1951 the parties' respective sales quotas for the United Kingdom market were approximately as follows:

	per cent
AEI Group	33½
GEC	30
Crompton	12½
NV Philips and Stella	10
Siemens	10½*
Cryselco	3½†
	100

General approval was required before any party to the agreement could grant a patent licence to an outside manufacturer. Prices and terms of sales were controlled in all the territories concerned and the arrangements accordingly duplicated to some extent the arrangements of ELMA in this country. Through separate agreements with IGEC, the British Group continued to be precluded from trading in North America and to be protected from competition by IGEC in this country until 1951, when new agreements with IGEC terminated these restrictions. The Electric Lamp Statistical Office Ltd., formed by the British Group with offices in London, performed under the 1941 and 1948 agreements similar functions in relation to sales quotas to those carried out at Geneva under the Phoebus Agreement.

160. The pooling or cross-licensing of patents by the parties to the agreements we have mentioned and to various other agreements, and the licensing of patents to outside manufacturers on terms which contained their competition by requiring them to observe common prices and terms and limitations on output, were fundamental to the structure of the electric lamps industry in the years to 1951. By that date, however, the more important patents relating to filament lamps had expired and patents (as distinct from manufacturing know-how) were of major importance mainly in the field of discharge lamps. From 1948 there had been certain relaxations in the patent policy pursued by the members of ELMA. Negotiations begun in about 1948 between certain members and Thorn and Ekco (in which Thorn acquired a controlling interest in 1949) were associated with writs for infringement issued against Thorn and allegations of infringement against Ekco, in connection with patents relating to luminescent powders for fluorescent lamps, of which Thorn and Ekco were the leading independent manufacturers. However, by 1950 these negotiations had not resulted in offers of licences on terms which were acceptable to Thorn or Ekco. The ELMA patent policy was revised further in the light of the Patents Act 1949 and the Monopolies and Restrictive Practices (Inquiry and Control) Act 1948, and our predecessors reported that the members of ELMA had decided, inter alia, to grant licences at reasonable royalties subject only to the observance by licensees of common prices for the patented articles and the licensor's rights to prescribe the types and specifications of lamps to be made under the licences.

161. The Phoebus policy of prohibiting aid, directly or indirectly, to outside manufacturers had extended, as we have indicated, to the withholding or limiting of the supply of the principal lamp components by the parties to outside manufacturers. Common prices were fixed for the supply of such components as could be sold to any manufacturers. Patent licences granted by leading members of the

*Acquired by AEI in 1955.
†Owned jointly by GEC and Philips.

British Group (see paragraph 153) to Crompton, BELL, Aurora and British Luma in the 1930's were subject to undertakings by the licensees not to supply certain lamp components to manufacturers not approved by the licensors. By 1939 the members of ELMA were, jointly, virtually self-sufficient in the principal components, and independent manufacturers relied largely on imports. During the war the supply of components was controlled by the Government and an allocation system was operated. The 1948 Lamp Agreement (see paragraph 159) contained a provision substantially similar to that in the Phoebus agreement prohibiting aid to outside manufacturers; the ELMA members regarded this as governing supplies of components to non-members. However, the accepted interpretation was that glass bulbs, glass tubing and rod and certain other items could be sold without infringing the agreement, but that filaments and also fluorescent powders (which were covered by patents) were not to be supplied except to fellow-members or licensees. The fixing of common prices for components continued, and there were generally different common prices for sales to fellow-members, to the Controlled Companies, to British Luma (a licensee of the leading members), and to other independent manufacturers. In 1949 AEI and GEC, who between them had an almost complete monopoly in the supply of glass bulbs, formed a jointly-owned company, Glass Bulbs (see paragraph 11), to manufacture bulbs, mainly for GLS lamps, on a high speed machine imported from the USA. The capacity of the new machine, with existing machines retained for the production of special types, was far in excess of the requirements of the industry in this country. At the suggestion of our predecessors, Glass Bulbs wrote to the Ministry of Supply in 1951 to clarify its intentions regarding the supply of bulbs made on the new machine; it confirmed that the bulbs would be distributed without discrimination at the same prices, quantity for quantity, to all comers except its shareholders and the Controlled Companies, who would be supplied at lower prices. At the time of our predecessors' inquiry the ELMA members' selling prices of components to independent manufacturers were in some cases the same as to fellow-members (e.g. for clear glass bulbs, glass rod and tubing) and in other cases were higher (e.g. for pearl bulbs, caps and molybdenum wire). In the course of the inquiry, independent manufacturers repeatedly expressed uneasiness at their dependence on the ELMA members for supplies of components, particularly glass.

162. An addition to the Controlled Companies was Evenlite, which had applied to join ELMA but after negotiation was acquired by the principal ELMA members in 1946 and added to the Controlled Companies group (see paragraph 9); since then it has supplied the whole of its output (which consists of decorative strip and architectural filament lamps) to its shareholders. A further addition to the Controlled Companies was Splendor, which was acquired from NV Splendor in 1950 (see paragraphs 150 and 157). The Controlled Companies' own house brands were no longer cheaper than the ELMA main brand equivalents as they carried the same retail list prices; however, the bulk of their sales consisted of lamps marked with customers' brand names, including Woolworth's Sunshine brand, which they sold at larger discounts or lower net prices than those fixed by ELMA and which were retailed at prices which were lower than the ELMA prices. It was estimated that the Controlled Companies supplied from one-quarter to one-third of the home market in GLS lamps in 1950, which was considerably less than their pre-war share of that market. By 1950 production by the ELMA members of Type B lamps introduced in 1935 (see paragraph 157) had ceased, apart from Crompton's 'Kye' brand.

163. In the year 1950 total production of electric lamps of all descriptions amounted to just over 250 million, valued at £13¼m. The members of ELMA accounted for 60 per cent by quantity of total production, the Controlled Companies for 13 per cent and the independents for 27 per cent. None of the independents produced the wide range of different types of lamps offered by the ELMA members; in most cases they made either GLS lamps or motor lamps or specialised in particular types such as the small flash and indicator lamps, and the majority were small concerns. By 1950 Thorn and Ekco, both of whom had expanded rapidly during and after the war, were each similar in size to the medium-sized ELMA members (see paragraph 159). In most cases Thorn's and Ekco's retail prices were the same as those fixed by ELMA, but the discounts they allowed were higher and, although they expected distributors to maintain their published resale prices and terms, neither had any enforcement machinery.

The Commission's conclusions and recommendations

164. The foregoing paragraphs set out in very abridged form the main facts on which our predecessors were called upon to make a judgement in 1951. They found that the conditions to which the 1948 Act applies prevailed in that about 60 per cent of both filament and discharge lamps were supplied by members of ELMA who operated a number of arrangements which restricted competition. In this context they noted, in particular, (a) that the members agreed together on the types of lamps to be manufactured, (b) that they agreed on common manufacturers' prices for each type and laid down the prices to be charged at each stage of supply and enforced these prices by collective sanctions, (c) that there were exclusive dealing arrangements which required all wholesalers who handled members' lamps not to sell lamps made by other manufacturers and which gave better terms to retailers who agreed to sell only members' lamps, and (d) that there were sales quota arrangements whereby a member could not increase his share of the total market of members without incurring penalties. They also noted the patent policies followed by the members, their attitude to standardisation, the position with regard to the supply of certain components to other manufacturers and the activities of the Controlled Companies which were owned jointly by ELMA members and marketed lamps through chain stores, usually at lower prices than ELMA lamps.

165. The Commission noted that the ELMA arrangements were markedly less restrictive than in 1939, the new patent policy proposed was more liberal and the quota system and the arrangements for the supply of components had been made less rigorous. The Commission considered that prices and profits, which had been unduly high before the war, were on average moderate in 1951. The Commission saw in the exchange of technical information within the industry a considerable advantage to off-set the potential dangers of the ELMA price ring, and they did not recommend that the fixing of common prices should be prohibited provided that two conditions were fulfilled. The first condition was that the exchange of technical knowledge should extend to all manufacturers within the system of common prices; and the second was that the prices, which the Commission suggested should be reviewed by the Government from time to time, should be reasonable. The Commission considered however that some, at least, of the relaxations in the ELMA arrangements which had been made during and after the war had taken place because of Government actions or requests or because of new legislation, and that 'old Phoebus ideas of a very restrictive kind' were certainly not dead; they did not feel, in all the circumstances, that the improved state of affairs could be relied upon to continue if the ELMA system was left

without considerable amendment and additional safeguards in the public interest. The Commission summarised as follows its recommendations for changes in the system and for safeguards on the manufacturing and on the distributive side to maintain and strengthen effective competition:

(i) that ELMA should undertake that members who sold lamp components (other than patented products and ready-coiled filaments) should make them equally available to members and non-members at prices which should not be higher to non-members than to members;

(ii) that, if the working of the new patent policy resulted in an appreciable reduction of the degree of competition to which ELMA was subjected, the whole question should be examined afresh;

(iii) that ELMA members should give an assurance that the Controlled Companies would continue to provide a measure of competition as suppliers of cheap lamps and that they would not be used as fighting companies*;

(iv) that the sales quota system should be brought to an end;

(v) that ELMA's rules about Type B lamps should be altered to remove quantity and quality restrictions;

(vi) that the arrangements for exclusive dealing and aggregation of quantity rebates should be brought to an end;

(vii) that payments to associations of distributors should be brought to an end;

(viii) that the enforcement of resale price maintenance by means of collective sanctions should be brought to an end;

(ix) that ELMA's rules should be altered to permit other distributors as well as co-operative societies to give 'dividends'.

The Commission considered that, failing these recommended safeguards and changes, the ELMA system might be expected to operate against the public interest in the future, and that anything which had the effect of reducing the degree of competition advocated in the recommendations would make it necessary, in their view, to re-examine the whole question. The Commission discussed in detail in their report each of the recommendations summarised above. Amongst the points made we have noted, in particular, certain additional recommendations and comments the substance of which are given in the following paragraphs 166–169.

166. As regards glass bulbs made on the new American machine, the Commission considered that the supplying company should give an undertaking, additional to that already given (see paragraph 161), to publish a price list showing the gross prices and quantity discounts at which it was prepared to sell.

167. The Commission accepted that the Controlled Companies had been left to run their businesses independently of the shareholders' management committees and said there was no evidence that they had been used as fighting companies. However, although so far as the general public was concerned competition between the Controlled Companies and the ELMA members existed, ELMA had admitted that so far as was practicable the policy was that the Controlled

*Mrs. Joan Robinson in an addendum to the report considered that it was unrealistic to expect the Controlled Companies to compete freely and effectively with ELMA members while still being owned by them, and recommended that the Government should acquire the share capital of these companies. It was her view that this would generally strengthen the effect of the other recommendations.

Companies should not compete in ELMA markets—that is, at the wholesale and retail levels. The Commission considered that the preservation of the Controlled Companies as competitors would become even more important if ELMA or any of its members were to absorb any of the independent manufacturers and they recommended that if this should occur, or if the Controlled Companies should cease to practise an independent price policy, the position of the companies should be reviewed in the light of the situation as it would then exist.

168. The Commission regarded the system of aggregated rebates made by ELMA to wholesalers, retailers and users (whether exclusive or not) based on their total purchases of ELMA lamps, and of discounts to users calculated on a similar basis, as of less importance than the exclusive agreements with distributors operated by the ELMA members. However, they considered that the system was 'certainly a form of pecuniary pressure to buy exclusively from ELMA' and, taking into account the extent of the statistical machinery it involved, they recommended that it too should be brought to an end.

169. In recommending that the ELMA rules should be altered so as to remove both the limitation on the quality of Type B lamps allowed and the upper limits on efficiency and life of these lamps (see paragraph 157), the Commission said that no doubt the lower limits of efficiency and life would have to be below the limits for ELMA lamps proper, but upper limits were contrary to the public interest. As regards the rated average life of 1,000 hours for GLS lamps which had been standard since before the Phoebus agreement, the Commission said that there could be no absolutely right life for the many varying circumstances to be found amongst consumers in any given country so that any standard life must always represent a compromise between conflicting factors. BSI had always adopted a single standard life for GLS lamps and both BSI and the British Electricity Authority as well as most lamp manufacturers had said in evidence that they regarded 1,000 hours as the best possible compromise at the time. The Commission dismissed as misconceived the frequent allegation—but not one made to the Commission—that the Phoebus organisation artificially made the life short with the object of increasing the number of lamps sold. However, the attitude of ELMA members struck the Commission as rather arbitrary as when asked whether it would not be possible to market a type of lamp with a longer life in order to test whether in fact the public liked it, their reply was to the effect that it was a matter on which the public could not judge and which ought to be left entirely to the manufacturers, and that in any case users as well as manufacturers were represented on the BSI committee which drew up the relevant GLS specifications. The Commission considered that the whole question contained technical difficulties and was best left to BSI to keep under review in the interests of both consumers and manufacturers, and it thought effective representation of consumer interests particularly important in this context where many of the manufacturers' representatives were bound together by close commercial ties and trading agreements.

Implementation of the recommendations

170. On 19th May 1952 it was announced that the Government were in general agreement with the Commission's recommendations, except that they proposed for the time being to reserve judgement on the recommendation that aggregated quantity rebates should be brought to an end; and it was stated that ELMA had undertaken to bring its arrangements into conformity with the Government's conclusions. Subsequently ELMA notified the Ministry of Supply of the detailed action taken to give effect to the Commission's recommendations.

CHAPTER 4

The United Kingdom Electric Lamps Industry Since 1952

The Electric Lamp Industry Council (ELIC)

171. As we have recorded in chapter 3, ELMA implemented its undertaking to give effect to the Commission's recommendations (other than that relating to aggregated rebates, on which the Government had reserved judgement); and it continued its activities in directions unaffected by the recommendations, including the fixing of common prices and discounts and the granting of aggregated rebates. In March 1955 Philips and Thorn made an arrangement with the general intention that Philips should concentrate on GLS and discharge lamps and Thorn on fluorescent lamps. Some exchange of goods took place over a limited period, but the arrangement was cancelled by mutual consent in February 1957. In December 1955 Philips, through its two member subsidiaries, Philips Electrical and Stella, resigned from ELMA; Philips has said that this was because it believed that membership 'tended to inhibit their commercial development'. The competition in discounts which developed in 1956 between the members of ELMA (then comprising the AEI and GEC companies, Crompton, Cryselco, BELL and Aurora) on the one hand, and Philips, Thorn and Ekco on the other, was described at the time by one ELMA member as a 'price war'. Agreed common prices, discounts and rebates were continued within ELMA until the coming into force of the Restrictive Trade Practices Act in 1956. As we have already said in paragraph 12, early in 1957 ELMA was dissolved and ELIC was formed with a membership which comprised the former members of ELMA, with Thorn, Ekco, Philips Electrical and Stella; this new association now included all the larger manufacturers of electric lamps and two of the smaller ones. ELIC introduced a Recommended Non-Mandatory Trading Structure, applicable to the members' main brands of lamps of the descriptions covered by our reference and also to certain low voltage lamps, which was described at the time as a reasonable compromise on the basis of rewarding customers according to size, and an attempt to reconcile the arrangements within and outside ELMA. The first structure, which was an interim structure, was in use from 1st March 1957 to 30th June 1957 and during this period Philips and Thorn terminated their respective discount arrangements with certain customers. The second structure, which came into use on 1st July 1957, applied to the same descriptions of lamps; it defined buyers and specified rates of discounts which were a compromise between the former ELMA discounts and those of Philips, Thorn and Ekco. The ELMA classifications had been based on the buyer's total purchases of ELMA members' lamps; the ELIC classifications, however, were based on the buyer's total purchases of lamps from all sources. The retail list prices to which the rates of discounts were related were to be determined by the members individually; in practice, they remained almost identical as between members. In September 1957 particulars of the agreement for the construction of ELIC and the two recommended non-mandatory trading structures were entered in the register of restrictive trading agreements. The Restrictive Trade Practices Act 1956 operates, in relation to specific recommendations made by trade associations to their members, as if the members of the trade association agreed to comply with the recommendations.

172. In June 1959 the Registrar of Restrictive Trading Agreements informed ELIC that he would shortly issue a formal notice advising his intention to refer to the Restrictive Practices Court the agreement registered by ELIC. In November 1959 ELIC informed the Registrar that it had been unanimously agreed to abandon the agreement as from 31st December 1959. On 15th December 1959 the members of ELIC agreed that a Discount Schedule, which it was understood would not come within the provisions of the Restrictive Trade Practices Act 1956, should be adopted as from 1st January 1960. On 23rd March 1960 the Registrar was notified that members of ELIC voluntarily supplied information to one another of changes in discounts to their customers which had occurred in the preceding month, and on 12th May 1960 he was supplied with a copy of the Discount Schedule. Apart from the fact that the 1957 Structure recommended the rates of discounts to be allowed and the 1960 Schedule did not, the schemes were basically the same. The 1960 Schedule (see appendix 8, table 6) covered precisely the same lamps as the Trading Structure which had been abandoned. The purpose of the Schedule was said to be to provide a basis for the collection of information as to discounts granted by members to their buyers; the granting of discounts was to be the sole prerogative of each individual member, as was the definition of any particular class of buyer. The Schedule divided buyers into the classes which had been used in the practice of the trade for many years, and buyers within different classes were classified according to their total purchases from all sources of all brands of goods covered by the Schedule, apart from local authorities who were classified according to types and populations. Wholesalers with annual purchases of £20,000 and over had originally been listed by ELIC in connection with the operation of the 1957 Discount Structure. Under the 1960 Schedule, there were three classes of wholesalers. Those with annual purchases of less than £20,000 were in class A and were not listed by ELIC. Those with annual purchases of £20,000 to £49,999 were in class B and those with annual purchases of £50,000 and over in class C. ELIC collected, collated and circulated, annually, details of lamp purchases made by wholesalers in classes B and C. Individual members were also able to reclassify wholesalers on the basis of requests made to the association to collect and collate the figures of sales made to particular wholesalers; these details were also circulated for the benefit of all members. However, we have been told that individual members did not (and do not) necessarily recognise as distributors of their lamps all the wholesalers listed. ELIC also issued two lists of commercial and industrial users, those with annual purchases of (i) between £1,000 and £10,000 and (ii) £10,000 and over. After the adoption of the Discount Schedule, members supplied returns of changes in discounts granted in the preceding month to classes of buyers, and also to named individual buyers either because they did not come within a defined class or because the discount granted differed from the member's general discount to the class of buyer concerned. Changes made in the preceding month in standard consignment quantities and minimum purchase value for quantity discount purposes were also notified.

173. As indicated above, the rates of discount applicable to each class and grade of buyer covered by the Discount Schedule were fixed by the members individually; in practice, the rates were the same, category for category. Retail list prices as well as discounts were fixed by the members of ELIC individually, and were also generally the same, type for type, although there were some variations. All the members maintained their respective resale prices of their main brands at all stages of supply.

174. Other activities of ELIC included the collection and circulation of statistical information. Members provided monthly returns to the Board of Trade showing, by quantity, figures of their respective production of all brands of lamps under each of the five Board of Trade classifications of electric lamps. They also provided monthly returns to the Board of Trade under the same classifications showing, by quantity and value, their home sales deliveries of their main brands of lamps. The members sent copies of these returns to ELIC where they were collated, and the totals of members' production and home sales deliveries circulated to members. A further information arrangement related to the introduction of new lamp developments. Members agreed to give each other six weeks' notice of the marketing of new types, including such details as ratings, dimensions, characteristics etc.

175. Unlike ELMA, one of the chief activities of ELIC was in the technical field, and a number of technical committees and panels of senior technicians exchanged experience on design and manufacture. The purpose of these committees was said to be to progress the work of standardising dimensions and electrical characteristics preparatory to participation in the promulgation of BSI and international standards for lamps. Other activities included the sponsoring of market surveys, work connected with standardisation of packaging and variety reduction, and co-operation with official bodies and other trade associations.

The Electric Lamp Industry Council Ltd. (ELIC Ltd.)

176. ELIC Ltd. had been formed in 1958 primarily as a vehicle for the financial support of the British Lighting Council, an advisory and promotional body of which it was one of the founder members. For a time ELIC and ELIC Ltd., which had the same membership, were operating in parallel, but in 1961 it was considered administratively more convenient to dissolve ELIC and concentrate all activities in ELIC Ltd. Until 1st April 1967, when BLI introduced certain changes in its trading arrangements, the 1960 Discount Schedule was operated substantially unchanged by the members of ELIC, individually. The following paragraphs 177–183 inclusive contain references to a number of the activities of ELIC relating to commercial matters noted in the course of examination of certain records of the association covering the period 1962 to the beginning of 1968; these activities appear to have been directed, in the main, towards facilitating the operation of the discount structure.

177. For a time, ELIC collected and circulated information about contracts placed by local authorities. The records show that in 1962 members were requested to supply details of the results of tenders to local authorities and a list was circulated to members of the names of local authorities who had placed contracts wholly or in part with non-ELIC suppliers with, where available, the names of these suppliers. The term 'non-ELIC suppliers' covered not only the independent manufacturers but also the members' own companies selling second brands. A covering letter circulated to members with the list stated that, according to the members' replies, out of 326 tenders to local authorities on which information was available non-ELIC suppliers had obtained, wholly or in part, 96 contracts as against 72 in the previous year. We understand that the exercise was then discontinued.

178. In 1962 it was reported at a meeting of the Commercial Committee of the association that members' books of commercial and industrial users with annual purchases of £1,000 and over, classified in purchase brackets, were out of date

owing to the number of amendments issued over the preceding eighteen months, and it was decided to print new lists covering the requirements of all the members, with blank sheets for amendments. A numbering system was later approved for bringing the lists up to date which involved the circulation to members of changes of name, changes of ownership and changes in purchasing power, to be compiled from details supplied by members and from the secretariat's scrutiny of published information. It was specifically noted that members were not obliged to adopt the system. The printed lists were produced in two forms, one for the use of members and the other for distribution to wholesalers; the number of copies required was reduced from the original figure of 3,820 to 3,700 as it was considered that no useful purpose would be served by distributing the lists to large retailers. Also in 1962, the Council of Management of ELIC discussed GLS lamps having 2,500 hours life, and it was recorded that members had agreed a specification (which conformed to IEC Publication 64A, see paragraph 3) and were considering how soon their production could be converted to this specification from the various extended life GLS lamps then being manufactured. ELIC has explained that 'one of the main functions of the association is to form a forum for discussing technical matters relating to electric lamps and particularly standardisation. Crompton had introduced a long life lamp in its main brand, and other members were considering doing likewise and hence the discussions relating to the performance and characteristics of such lamps.'

179. In October 1963 the Commercial Committee decided to circulate to members a comparative list of purchases over the three preceding years by those wholesalers whose purchases from ELIC sources were below the purchase brackets in which they were classified. The Committee also decided to extend the ELIC service to members in connection with the classification of wholesalers (see paragraph 172) so as to include, wherever possible, wholesalers' purchases from non-ELIC sources to enable a better assessment to be made of the larger wholesalers' overall purchases; it was appreciated, however, that some wholesalers might be reluctant to supply details of their business with non-ELIC manufacturers. It was arranged that, if the figures collected from members of sales to a particular wholesaler amounted to considerably less than the figure claimed by the wholesaler, he should be asked to supply details of his purchases of lamps from non-ELIC manufacturers. Also in October 1963 the Council of Management asked the Commerical Committee to re-examine a schedule of multiple retailers, classified according to the number of branches, which had been circulated in the previous month. New schedules were to be compiled consisting only of multiple retailers known from the experience of members to be selling lamps. The Council wished the new schedules to recommend a suitable breakdown by purchase brackets instead of by numbers of branches. Individual members were asked to supply details of their sales of lamps to the multiple retailers listed and to indicate which of them they had already classified as 'large retailers' or as 'trade users'. In November 1963 the Council of Management asked the Commerical Committee to make a careful study of a recorded list of large users primarily buying non-ELIC brands and it was decided to collect details of members' direct sales to these users. The association has said that this exercise proved abortive.

180. In November 1964 the Commercial Committee examined a list, subsequently circulated to members, compiled from members' returns of buyers whom they (individually) recognised as street-lighting fittings makers and erection contractors, and it was recorded that where orders were received from this type of buyer for lamps for initial equipment members sought the name of the local

authority for whom the equipment was required. The association has explained that the purpose in circulating the list was to enable a member who received an inquiry from a buyer on the list with whom he had not previously done business to be satisfied, without further investigation, that the buyer concerned was a genuine contractor. The association added that it is open to any manufacturer to supply any contractor, whether listed or not, but that if a contractor's name is not on the list presumably the manufacturer makes inquiries. The association also explained that it has been the practice for many years for manufacturers to require contractors to state the name of the local authority for whom the lamps are required in order that a check may be made, from invitations to public tender, whether the quantity of lamps ordered is in line with the local authority's requirement and that lamps are not being obtained for the purpose of normal resale (in which case a different rate of discount would apply). The list of recognised contractors was last amended in April 1965.

181. In December 1964 it was recorded that the question of the rationalisation of production of slow moving lines was being considered; and that as the Commercial Committee from time to time examined the possibility of variety reduction it had been asked to extend its examination to include rationalisation of production. ELIC has said that the following considerations led to this request:

> For competitive reasons all Members endeavour to show in their catalogues ranges of lamps as complete as possible and these in some cases include types shown in their competitors' catalogues though the demand on them for such types is very small. Members are also called upon to supply lamps which are obsolescent and this they do as a service to the public although the demand for such obsolescent lamps may be very small. In order to reduce unnecessary varieties of types of lamps and the manufacture of types of lamps which were obsolescent it was thought that it would be desirable if the manufacturers could meet together and exchange information as to the demand for the various types of lamps placed on them individually. By this means it was hoped that it would be found that all manufacturers could reduce the varieties of lamps which they were offering because in many cases there would be alternative types of lamps which would satisfy customers' requirements. New lamps are continually being developed and introduced to the market so that reviews of this sort are necessary to assist the trade in reducing their stocking problems and to help the manufacturing side of the industry which is called upon to produce many thousands of varieties of lamps.

In June 1965 the Commercial Committee discussed the question of rationalisation of production; one member thought that it was primarily a matter for individual members' factories while another suggested that a central register of stocks might be recorded by the secretariat from which members could call lamps from time to time. It was agreed that some rationalisation was desirable and that a panel should be set up to examine the question and formulate a policy. An *ad hoc* panel was set up in September 1965 and it first considered automobile lamps (which are outside the terms of our reference). It was recorded in December 1965 that most of the information required of members had been received but that one member had yet to say which lamps he would be prepared to make for others and which he would be willing to buy (including maximum quantities). All the information when received would be collated and circulated for detailed examination by the panel. ELIC has explained that it was decided that the panel should in the first instance concentrate on automobile lamps as a wide variety of types were being offered and only three manufacturers were concerned, and that considerable progress was made in the reduction of lamp varieties and rationalising in the way outlined in the passage quoted above. It said that the general philosophy was intended in the future to apply to reference lamps also and that, in fact, in 1967 some progress had been made in respect of reference lamps for

use with projectors where, after discussion, it had been found that a number of outmoded lamps which were still being offered could be discontinued as there were suitable alternatives in the manufacturers' lists. Other steps towards variety reduction made at different times resulted in the elimination of a large number of GLS lamps. An attempt was made to eliminate clear GLS lamps from some members' catalogues, and ELIC has told us that 'one of our unsuccessful struggles was to reduce the demand for clear lamps, but we were just getting along nicely when designers produced crystal fittings which need clear lamps, so we did not get very far'. An attempt to eliminate the 75-watt GLS lamp from members' main brands was more successful in that when the prices of 40-, 60-, 100-, 150- and 200-watt lamps were reduced, the price of the 75-watt lamp remained unchanged.

182. In 1966 the period of notification by members of the marketing of new lamp developments (see paragraph 174) was increased from six weeks to four months. Where field marketing tests are undertaken, members supply additional information, including the area to be covered, the duration of tests and the number of lamps involved. No public announcement of a new lamp development may be made by the initiating member before four months after notification date. A copy of a memorandum dated 1st June 1966 setting out the agreed procedure for notification is in appendix 4.

183. In June 1967 the Commercial Committee agreed to ask three large wholesalers who together account for a substantial volume of sales by the members, and who are the only wholesalers selling lamps to other wholesalers, to keep records of their sales to other wholesalers. We are told that this exercise has two purposes; first, to enable members to calculate total sales to wholesalers and secondly, as an aid in the classification of individual wholesalers in purchase brackets. Early in 1968 the Commercial Committee set up an *ad hoc* panel to examine

> whether the time was now opportune for individual members to extend the principle of minimum consignment quantities with the object of more efficient distribution in the best interests of the Trade and the general public. At the same time, consideration was to be given to the possibility of further variety reductions having regard to the approaches and published appeals by the Trade for fewer types of lamps than were at present said by retailers to be necessary to hold to give a comprehensive service to the public.

It was decided to confine the study, in the first instance, to GLS lamps.

The present position

184. At the start of our inquiry, the members of ELIC were:

AEI Lamp and Lighting Ltd. (AEI L & L)	(wholly owned by BLI)
Atlas Lighting Ltd. (Atlas)	(wholly owned by BLI)
BELL	
Crompton	
Cryselco	(owned jointly by GEC and Philips)
Ekco	(controlled by Thorn*)
Osram	(wholly owned by GEC)
Philips Electrical	(wholly owned by Philips)
Pope's Electric Lamp Co. Ltd. (Pope's)	(wholly owned by GEC)
Stella	(wholly owned by Philips)

*Ekco became wholly owned by Thorn in 1966; in 1967 ownership was transferred to BLI.

In April 1967 BLI become a member on the resignation of AEI L & L, Atlas and Ekco; the membership remains otherwise as above. The activities of the association are directed and controlled by a Council of Management whose composition, with the representation and votes, is as follows:

Member	*No. of representatives*	*No. of votes*
BLI*	2	4
Crompton	1	2
Cryselco	1	1
Osram	1	2
Philips	1	2

185. ELIC's estimated budget for the year ended 30th June 1968 was £15,480. Members' annual subscriptions are calculated in elevenths of the budget; BLI's subscription is four-elevenths; Crompton, Osram and Philips each pay two-elevenths; Cryselco pays one; and BELL pays a fixed sum of £250. The association also collects subscriptions from members for its support of the British Lighting Council (BLC), an advisory and promotional body, whose membership comprises The Electricity Council, ELIC Ltd., the Electric Light Fittings Association Ltd. (ELFA), The Electrical Contractors' Association (ECA) and, until it resigned in June 1967, The Electrical Contractors' Association of Scotland (ECAS). The Electricity Council, ELIC and ELFA each contribute about one-third of the BLC's annual budget of about £80,000; the ECA contributes about £2,500, and the ECAS contributes about £350. Of ELIC's contribution of £29,380 for the year ended 30th June 1968 BLI paid 41 per cent, Osram 20½ per cent, Philips 16½ per cent, Crompton 12 per cent, Cryselco 10 per cent and BELL a fixed sum of £250.

186. A staff of five, including the Director, is employed at ELIC's offices in London. The Director has estimated that only about 7 per cent of the time of the staff is spent on commercial matters, which consist in the main of the circulation of standard letters. The bulk of the work is in the servicing of the various technical committees and sub-committees and panels, and in liaison with other organisations. As part of the service to members, data sheets about the requirements in Europe are circulated which set out tariff rates and general export information in respect of each EEC and EFTA country.

187. The Commercial Committee has general responsibility for commercial matters, including the exchanges of trading information, the classification of buyers, variety reduction, standardisation of packaging, labelling and marking, and some discussions with other trade associations and government departments on non-technical matters. It also deals with standardisation of consignment quantities, purchase tax, new legislation, matters passed to it by the Council of Management for study, lighting promotions with the BLC etc. The following information arrangements continue in operation; statistics of production and deliveries (see paragraph 174); annual grading of wholesalers in classes B and C (see paragraph 172); monthly notification of changes in discounts, standard consignment quantities and minimum list values for quantity discounts (see paragraph 172); four months' advance notification of the marketing of new types of lamps (see paragraph 182); and the collection from three large wholesalers of records of their sales to other wholesalers (see paragraph 183).

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*A special resolution passed in April 1967 gave BLI reduced representation but the same voting powers on the Council of Management as previously held by AEI L & L, Atlas and Ekco, together.

188. The terms of reference of the technical committees are reproduced in appendix 5. Each of the three main committees, which are directly responsible to the Council of Management and advise it and the Technical Directors' Committee on technical matters, deals with a particular description of lamp (tungsten, tubular fluorescent, and discharge) and is responsible for a number of related sub-committees and panels. A system of schedules, which was originated by ELMA, is maintained which lists photographic and projector lamps produced by members with the relevant technical data; the primary purpose of the schedules is to give each lamp a reference number for convenience of ordering and accurate identification of replacement lamps. New lamp developments, whether notified formally under the procedure outlined in paragraph 182, or we are told, more often disclosed by members at an early stage of development, are considered by the relevant committee or sub-committee with particular reference to the need for standardisation of electrical and mechanical inter-changeability. As well as work connected with the technical developments of members, the various committees and panels deal with preparatory work on specifications for British Standards arising from their representation on BSI Committees and Sub-Committees; they hold regular meetings with ELFA and keep the BLC informed of technical data on lamps; they also edit many BLC publications on lamps and lighting; and they co-operate with the principal international organisation concerned with electrical standards including lighting, IEC (see paragraph 3) and its sub-committees and working groups, and with other international and European standardisation organisations. While the individual members have their separate arrangements for liaison with government departments and other public bodies, there is provision for technical committees to meet such bodies, nationalised industries and trade associations when requested; there have been several such meetings before which there has been prior discussion so that the association's representatives may give 'an industry view'.

Discussions between ELIC and the EWF

189. It has been the practice of representatives of the successive manufacturers' associations, ELMA (see paragraph 150), ELIC and ELIC Ltd., and of the principal electrical distributive trade associations, notably the EWF, to meet from time to time to discuss matters of mutual interest. Discussions took place between ELIC and the EWF, through the medium of the ELIC General Purpose Committee/EWF joint meetings which are chaired in turn by ELIC and by the EWF, about the 1957 Trading Structure and the 1960 Discount Schedule, and the records of these meetings indicate that neither scheme was considered by either body to be wholly satisfactory. The EWF made some counter proposals to the 1957 scheme as originally drawn up, and received certain concessions in 1958 which included improvements in the terms to large wholesalers. In 1962 the EWF proposed a simplified trading structure based on a trade discount of 25 per cent, 'to be allied wherever possible to reductions in list prices', instead of the then 30 per cent. This proposal was unacceptable to the members of ELIC individually, who considered that, amongst other disadvantages, it would increase distribution costs and reduce the retailers' margins which had already been cut by recent increases in terms to large users. (Shortly before this, the quantity terms allowed to trade users had been withdrawn by one member and the terms consolidated in basic discounts for the different purchase brackets, resulting in higher rates for all large users. The change had been followed by the other members.)

190. At a joint meeting held in July 1964 the ELIC representatives said that the lamp manufacturers attached great importance to the holding of periodic meetings between the two associations as they considered that these helped to maintain contact and permitted discussion on aspects of lamp distribution and other matters on a broad basis. The EWF representatives strongly subscribed to that view. At a joint meeting in May 1965 it was stated that ELIC was seriously considering the existing trading structure in the context of the possible abolition of resale price maintenance, and would probably seek a further meeting at a later date. At a joint meeting held in November of the same year the EWF was informed that all the members of ELIC were, individually, trying to produce a new workable trading arrangement. The then Chairman of ELIC, who at that time was also the Managing Director of BLI, said at the meeting that the key to any future discount structure was simplicity; but that a solution was not yet in sight. He said that the discount should be readily recognisable and simple; there should be no books or lists of customers issued by ELIC; the structure should be suitable for and should positively encourage streamlined distribution; and margins to wholesalers should be sufficient for them to take a real interest in lamps. As far as the manufacturers were concerned, if a workable scheme could be evolved, anything which would make the wholesalers happy would be considered provided it encouraged those who were prepared to do a good job and not inflate prices; and he added that constructive comments from the EWF would be welcomed. The EWF then put forward a scheme, again based on a trade discount of 25 per cent off list prices, which was said to be the discount trade buyers would obtain on other products, and it proposed that wholesalers should receive at least a difference of 15 per cent between their buying and selling terms, with a scale of quantity discounts for single orders. The members of ELIC said that the EWF's proposals would be given serious consideration.

191. There have been occasions when particular rates of discount as distinct from a general discount structure have been discussed at the joint meetings or have been the subject of correspondence between the two bodies. Some of these occasions related to the classification of individual buyers; on one such occasion when the EWF challenged a particular classification the Director of ELIC explained that the association's procedure for classification was 'to accept the word of the Managing Director of a wholesale distributor or user that the net annual value of his purchases of electric lamps is £x; this would be sufficient for us to notify ELIC members accordingly'. In May 1964 the Director of ELIC, at the request of a member, handed to the Director of the EWF a copy of new trading terms for sodium and mercury discharge lamps which the member was proposing to introduce at the same time as he introduced revised prices for these lamps. The Director of the EWF informed the members of his Council and Lamp Committee that he had indicated to the Director of ELIC that members handling these lamps 'would not be at all pleased' and that an urgent meeting would be requested; and that he had been given an assurance that it was unlikely that 'any manufacturer would be prepared to introduce a new trading structure on these lines without an opportunity of discussing it with EWF'. Following a discussion of the matter at a joint meeting on 21st July 1964, the Director of the EWF informed the members of his Council and Lamp Committee by letter that 'as a result of the discussion at that meeting the manufacturer who was proposing to introduce the new trading structure has made certain amendments to it'. He enclosed details of the revised proposals, and went on

> I understand that the manufacturer concerned will be introducing these changes at the beginning of September. It is anticipated that the other manufacturers will be

making similar changes in their trading structure. The alterations in the revised proposals, as compared with the original proposals, are that the discount off new trade price to retailer/contractor up to £5,000 per annum is now trade plus 5 per cent for £50 order as compared with an original automatic 5 per cent; the discount off new trade price to users over £10,000 per annum is 7½ per cent in place of the original 10 per cent.

The revised proposals were introduced by the originating member in September 1964 and formally notified to ELIC. The new terms were then matched by the other members concerned with discharge lamps. In July 1966 the EWF asked whether individual manufacturers would consider increasing their cash settlement discount by 1¼ per cent for settlement in seven days, making a total of 3¾ per cent. The members of ELIC undertook, individually, to examine the proposal but none of them increased the settlement discount.

192. Another matter discussed from time to time at the joint meetings has been the appointment of wholesalers by the individual members of ELIC; and at a joint meeting held on 24th September 1963 the members undertook to consult the EWF, individually, when considering the appointment of any wholesale distributor, whether electrical, grocery, hardware or other type.

193. Other matters discussed at the joint meetings in recent years have included variations in standard consignment quantities for the various types of lamps; terms for direct deliveries, reductions in variety of types; marking, packaging and labelling. In 1966, the EWF made a special study of the packaging and labelling of lamps and drew up recommendations. At a joint meeting held in January 1967 some of the manufacturers set up a display of new packaging and labelling which, it was said, demonstrated that they had adopted some of the EWF's recommendations.

194. We understand that the meetings of the ELIC General Purposes Committee/EWF are now held less frequently than in the past, generally only once a year. Meetings between ELIC and associations of retailers and contractors are held even less frequently.

The ending of resale price maintenance on lamps

195. On the coming into force of the Resale Prices Act in 1964, ELIC and the EWF applied for exemption on behalf of their respective members, who thereafter continued to maintain, individually, main brand resale prices, which remained substantially identical. On 2nd November 1965 the Registrar of Restrictive Trading Agreements issued a Notice of Reference to the Restrictive Practices Court in respect of electric lamps. After the Registrar's Preliminary Application for Directions on 13th January 1966 ELIC and the EWF duly entered appearances in the proceedings. The EWF subsequently withdrew its application. On 29th March 1966 ELIC applied to the Court for an indefinite extension of time for delivery of their Statement of Case on the grounds that it would involve them in an undue burden to prepare themselves to submit to investigation by two different tribunals—the Court and this Commission—in respect of what, in part, would be substantially the same matter. The Court rejected the application and indicated that it would not refuse to entertain a further application at a later stage, but would be prepared to consider it in relation to circumstances then shown to prevail. BLI has told us that in the early part of 1967 it and its competitors 'talked in general terms about what would happen when resale price maintenance came to an end, and there was complete unanimity about some things: first of all that we

had all been wrong in not recognising the disparity in the size of the wholesalers, and secondly, that it would be nice if we could do something about quantity discounts'. Early in March 1967 BLI met representatives of the EWF and outlined changes which it proposed to make in its discount arrangements, which included quantity discounts for wholesalers. It said that shortly afterwards it informed the other members of ELIC of its intentions and sent them copies of its new schedule. On 23rd March 1967 ELIC announced that its Council had decided not to proceed further with its application for exemption under the Resale Prices Act 1964, and it withdrew from the proceedings on 31st March 1967. On 16th June 1967 the Restrictive Practices Court refused to make an Order exempting electric lamps from the ban on resale price maintenance.

Changes in the trading arrangements of the members of ELIC in 1967/68

196. On 1st April 1967 BLI introduced certain amendments to its discount structure which represented a limited departure from the established system of discounts based on total lamp purchases which had been integral to the successive codes of commercial practice operated by ELMA, by the members of ELIC and, individually, by the members of ELIC Ltd. BLI abandoned this system for retailers and contractors. The changes included the introduction of quantity discounts to wholesalers for large single consignments from BLI, which were additional to discounts based on total lamp purchases. The discounts were recommended and were based on retail list prices which were also recommended but otherwise unchanged. Those changes were quickly matched by Crompton, Osram, Philips and (where relevant to its trade) by BELL, except that in Philips' case the discounts and list prices were published without recommendation. Details of the resulting standard discount structure (including certain amendments introduced by BLI in August 1967) which was operated, individually, by the members of ELIC until the end of February 1968 are in appendix 8, table 6.

197. We have been told that it has been traditional for the larger manufacturers in the electric lamps industry to offer small incentives to distributors in the autumn; that is, at the beginning of what is known as the 'lighting season'. In September 1967 Philips announced a gift scheme for wholesalers which appears to have provoked a variety of competitive sales promotions schemes which were introduced shortly afterwards by the other major manufacturers. (A short account of these schemes is in paragraphs 318–321.) A number of the distributors who supplied us with information in February and March 1968 about their trade in reference lamps referred to these schemes; one said 'I am pleased to inform you that these have now ceased—sanity has prevailed—and we are now back to normal trading terms from all manufacturers'.

198. On 1st March 1968 Philips began to operate a new trading structure which represented a more radical departure from the system of classifying buyers by total lamps purchases. For buyers other than wholesalers, Philips ceased to operate this system and introduced standard rates of discount with scales of additional quantity discounts related to the value of single consignments. For wholesalers basic discounts are now related either to purchases of all brands from all sources or, at the wholesaler's option, to the total of his purchases from Philips. In addition, wholesalers are given a more extended scale of consignment quantity discounts. Philips did not inform its competitors of these changes in advance of putting them into operation. It notified ELIC in the usual way in April 1968. Philips' major competitors told us that they learnt of the changes in March through

trade channels. None of these major competitors has adopted all the changes introduced by Philips, although some have adopted certain features. Philips' retail list prices and those of its major competitors remain substantially identical, type for type. The present trading arrangements of all these manufacturers are dealt with in more detail in chapter 5.

Inter-trading

199. As we have already indicated in chapter 1, inter-trading in finished lamps between the larger manufacturers is a long established practice. AEI's records indicate that in 1960 it was following the general policy of purchasing from outside where an acceptable alternative to a company product could be 'purchased outside at a price lower than the internal cost'. In general, the manufacturers inter-trade in lamps to supplement their respective production ranges, in particular, in lamps for which there is not a large demand and where other manufacturers are already making them in volume. Special factors apply in the case of sodium lamps which are used principally for street lighting, where each of the three principal manufacturers has developed and makes a different type (BLI makes the linear type; Philips imports the 'SOX' type from NV Philips; and Osram makes the integral type). Each inter-trades its type with the other two, and also sells to Crompton in order that each, including Crompton, may offer all three types to its customers, mainly local authorities. All four manufacture mercury discharge lamps of which there are a number of different types for different uses; these are inter-traded to some extent. In the result, the ranges of different types of reference lamps offered by the four principal manufacturers under their own main brand names are virtually identical. There is some evidence, as far as fluorescent lamps are concerned, that the members of ELIC have tended to confine inter-trading within the membership, and that sales to non-ELIC manufacturers have been actively discouraged. Prices in the inter-trading transactions are negotiated individually between the buyer and the seller and are generally net, equivalent to discounts of about 45 to about 70 per cent off list prices.

The cheap lamp sector of the market

200. As indicated in paragraph 14 what we have termed the 'cheap lamp sector' of the market covers the supply of lamps, mainly of GLS types, at lower net prices or higher discounts than those which apply to the four principal manufacturers' main brands; those which are retailed are, in the main, retailed at lower prices than main brands. In 1951 only Crompton of the then members of ELMA had any direct interest in the supply of cheap lamps (see paragraph 162). At the present time all four principal manufacturers participate directly in the cheap lamp sector with their second brands; BLI through Omega (acquired by Thorn in 1957) and Astralec (formed by Thorn in 1962); Crompton through its Hygrade brand; Philips through its controlling interests in Luxram (acquired in 1965) and Kingston (acquired in 1966); and Osram through Ascot (acquired by GEC in 1965).

201. The Controlled Companies, British Luma* and Maxim are the only other manufacturers of GLS lamps in this country. British Luma, whose sales are made almost entirely to co-operative wholesale societies, does not compete in the cheap lamp sector as the lamps are retailed at the same prices as those of the principal manufacturers' main brands, but they do qualify for dividend. Maxim

*See footnote to paragraph 327.

sells reference filament lamps, including GLS, in the cheap lamp sector. The Controlled Companies, whose sales of their own production of reference lamps represent just over 3 per cent of the total supply of reference filament lamps (see paragraph 23), thus compete in the cheap lamp sector almost entirely with their own shareholders' second brands. The Controlled Companies are dealt with in detail in chapter 6. Five small companies which manufacture fluorescent lamps or special types of filament lamps, and which between them supply about 3 per cent of the total supply of reference lamps, compete to some extent in the cheap lamp sector for these types; their arrangements are dealt with briefly in chapter 5.

Long life lamps

202. As we have already indicated, an average burning life of 1,000 hours has been the standard for GLS lamps in this country since at least the 1920s (see paragraph 2) but some GLS lamps are produced which have longer burning lives and give less light than 1,000-hour lamps. The current BSI Standard no. 161: 68* for 240 volt GLS lamps lays down a minimum rated average life of 1,000 hours and minimum values of luminous efficiency. There is no BSI Standard for GLS lamps with an average life of over 1,000 hours (see paragraph 3). In 1962, the IEC (whose specification no. 64† for GLS lamps is comparable to BS 161: 68) published specification no. 64A for a GLS lamp with a nominal rated life of 2,500 hours which allows a reduction in light output of 13 per cent below the standard for 1,000-hour lamps. Lamps made to this specification are in common use in certain continental countries, notably in Scandinavia where electricity is cheap.

203. Seven makes of GLS lamps designed for burning lives of over 1,000 hours are in current production in this country. Luxram first manufactured a 2,000-hour 'Double Life' lamp before the last war, principally for export to Norway; the lamp was first made to the specification of the Norwegian Electricity Commission but is now made to the IEC 64A specification. BLI is making lamps to this specification for export to Norway. Omega introduced a 2,500-hour 'Pluslife' lamp in 1953, that is, before it was acquired by BLI; the lamps are made to Omega's own specification. Maxim introduced a 'Long Life' lamp in 1954; the lamps, which account for 60 per cent of Maxim's production, are guaranteed for 2,500 hours and are made to Maxim's own specification. Ascot introduced a 'Double Life' lamp in 1958 and the brand name was changed to 'Extended Life' after GEC acquired the company in 1965; the lamp is designed for an average burning life of 2,000 hours, without guarantee. In 1960 Crompton began the development of a GLS lamp for the National Coal Board (NCB) which, primarily because of the high cost of lamp changing in and at coal mines, was interested in a lamp with a longer life than 1,000 hours and a light reduction of less than that permitted by IEC 64A. By the end of 1960 Crompton began the supply to the NCB of 2,000-hour lamps made to the NCB specification No. 241/62, later amended by No. 241/64, which allows an average life reduction of 7½ per cent below the light output of 1,000-hour lamps made to BS 161. Crompton and Kingston are now supplying the lamps to the British Railways Board (BR). The Controlled Companies introduced a 2,000-hour 'Dualife' lamp in August 1967; the lamps are made within the group to the companies' own specification. As we have said, none of these

*10s. Available from BSI, Newton House, Pentonville Road, London, N.1.
†Available from BSI. Price £1 18s.

various makes of long life lamps is available through the ordinary channels of distribution to the general public. Further details about the lamps are given in the sections of chapter 5 relating to each manufacturer of these types; and the evidence of the NCB, BR and other users is included in chapter 9.

Action following the Commission's suggestions in the 1951 report regarding reviews of the prices of lamps and glass bulbs, and the question of long life lamps

204. *Lamp prices.* As regards our predecessors' suggestion that the Government should review the prices of lamps from time to time (see paragraph 165), we are told that the Board of Trade carried out annual reviews until 1965; and that, in addition, prices were reviewed in January and February 1955 in connection with, respectively, a Parliamentary Question and a debate in the House of Commons.

205. *Prices of glass bulbs.* It appears that no steps were taken to confirm that Glass Bulbs was carrying out its undertaking dated 6th June 1951 (see paragraph 161) until February 1967 when an official of the Ministry of Technology was given an oral assurance that 'the continued policy direction given to the company was in accordance with the undertaking'.

206. *The BSI: lamp life and representation of consumer interests.* We have referred in paragraph 169 to our predecessors' conclusion that the question of long life lamps contained technical difficulties and was best left to BSI, the appropriate body to keep it under review in the interests of both consumers and manufacturers; and also to its view that effective representation of consumer interests was particularly important in this case, where many of the manufacturers' representatives (on the relevant BSI committees) were bound together by close commercial ties and trading agreements. We asked BSI what consideration it had given since 1951 to these references to it.

207. The Technical Sub-Committee LGE/6/5 of BSI concerned with GLS tungsten filament lamps has for some time been engaged in revising BS 161: 56, and the revised specification was published on 28th June 1968. BS 161: 68 applies to 240-volts GLS lamps with wattages of 25 to 1,500 watts; a minimum average life of 1,000 hours; bulbs clear or internally frosted; and bayonet or screw caps. (GLS lamps of other voltages, together with mushroom shape and other miscellaneous tungsten filament lamps, will be included in a revision of BS 555.) Appendix E to the Standard, which is the same as Appendix D to BS 161: 56 (apart from the date of the edition), reads:

The economic life of tungsten filament lamps

During the preparation of this 1968 edition of BS 161, the opportunity has been taken to review the question of the economic life of tungsten filament lamps for general lighting service. For many years the rated average life of standard lamps has been fixed at 1000 hours.

It is considered impossible to fix upon one objective life which will be beneficial to all classes of user for all lamp wattages or even for all classes of user for any specific wattage.

Theoretically, taking into account the costs of electricity and lamps (including the cost of replacement), the cost of lighting is a minimum when the ratio of expenditure on energy and expenditure on lamps is between 5 and 7.

Other things being equal, the economic life of the larger lamps is likely to be less than that of small lamps.

At any time and place, an argument for an average lamp life of other than 1,000-hours minimum could be developed for a given lamp rating having regard to:

(1) Wide variations in users' requirements (domestic users, commercial users, industrial users, government departments, street lighting).

(2) Wide variations in users' electricity costs.

(3) Wide variations in users' lamp prices.

The committee responsible for the preparation of this specification supports a common life for all lamp ratings in BS 161, and considers that the life requirements contained in the present specification represent a reasonable compromise.

In arriving at this conclusion it is recognised that special usage may warrant shorter or longer life objectives, the technical considerations for obtaining such services with standard general lighting service lamps being well established.

The only difference between BS 161: 56 and BS 161: 68, as far as lamp life is concerned, is a change in terminology from a 'nominal life of 1,000 hours' to a 'minimum average life of 1,000 hours'. BSI told us in March 1968 that the terms of Appendix D of BS 161: 56 had recently been reviewed by the Technical Committee and it had been agreed to reproduce it as Appendix E in the new edition.

208. On the question of what consideration it had given to long life GLS lamps, BSI has said that the question of a specification of a GLS lamp with a longer life than 1,000 hours was last considered by the relevant Technical Sub-Committee LGE/6/5 in October 1966. It was then noted that manufacturers could make lamps to IEC Publication 64A (see paragraphs 3 and 178) if required, but it was agreed that such lamps should not be included in the revision of BS 161 as they were not regarded as general service lamps. The NCB specification 241/64 for a 2,000-hour lamp (see paragraph 203) was noted, but the Committee indicated that if a long life specification was required it would recommend one corresponding with IEC 64A. This would be in line with the general policy of BSI in keeping British Standards in line with the IEC Publications wherever possible. BSI said that it had received very few inquiries in the last three years or so about a BSI specification for a long life GLS lamp; it did, however, have the following comments from the Central Electricity Generating Board about the 1966 draft revision of BS 161: 56:

With the development of better standards of lighting, the adoption of tubular fluorescent discharge lamps has established their use in preference to tungsten filament lamps in most industrial applications. Where tungsten filament lamps are still in use, the demand is not for those areas where high levels of illumination or high amenity requirements are the primary importance. The requirements of the tungsten filament lamp for industrial purposes are reliability and service over the most economical period of life, with a nominal regular acceptable lumen output.

To this purpose the Board have accepted the standard based on 'long life' tungsten filament lamps to the IEC Specification No. 64. Whilst we are in no difficulties in placing our contracts against this specification, the number of acceptable manufacturers to this specification is limited. We would, therefore like to see the draft proposed modified to include a 240-V tungsten filament lamp, having extended life and reduced lumen output of that established in the IEC Specification.

BSI said that the draft was not so modified because such a lamp was considered to be a special purpose, not a general service, lamp. There was a suggestion that it might be included in a specification for miscellaneous lamps if this were prepared.

209. The Technical Sub-Committee LGE/6/5 of BSI, which is responsible for tungsten filament lamps, consists of 17 members representing other organisations, with a secretary provided by BSI. The Chairman of the Sub-Committee is the Director of ELIC. The other members comprise five other representatives of ELIC; two representatives each of ELFA and the electricity supply industry in

England and Wales; and one representative each of the British Electrical and Allied Manufacturers' Association (Inc.), British Railways Board, the Illuminating Engineering Society, London Transport Board, the Ministry of Technology, the Public Transport Association (Inc.), the Home Office and the Society of Motor Manufacturers and Traders Ltd. On the question of consumer representation, BSI has said that 'it would seem that the Monopolies Commission in the context of lamps was concerned with users as a whole *vis-à-vis* manufacturing interests'. It explained that the constitution of the Technical Committee LGE/6—Electric Lamps

> includes a number of users, including Government Departments, the Illuminating Engineering Society and other associations of trade users e.g. Electric Light Fittings Association, Association of Supervising Electrical Engineers, Engineering Equipment Users Association, Association of Public Lighting Engineers, Electrical Contractors Association (Inc.) and London Transport. The general public as users of lamps for domestic purposes is not directly represented, although questions coming from the general public have frequently been referred to the Technical Committee. The Women's Advisory Committee of BSI, representing a large consumer interest, have the opportunity to nominate to technical committees, but have not chosen to do so in this case. It is also open to the Consumer Council, for example, to ask for representation on the committee. We think that the domestic consumer's interests are safeguarded by the knowledgeable user representation mentioned above.

CHAPTER 5

The Suppliers of Electric Lamps

I. The members of ELIC

British Lighting Industries Ltd.

210. *Formation.* As regards the objects of the merger of the lamp and lighting interests of Thorn and AEI, BLI told us at the start of our inquiry that the scale of production of the individual companies was not large enough to enable them, individually, to compete effectively in world markets; and that the merger provided the important advantages of economies of scale and reductions in overheads. BLI's further comments on the advantages of the merger are in chapter 11. Short accounts of the activities of Thorn and of AEI in the field of reference type lamps in the period before the formation of BLI are in appendix 1. The first step in the amalgamation of the lamp and lighting interests of Thorn and AEI was the acquisition in April 1964 by Thorn's subsidiary, Atlas Lighting Ltd., of Thorn's lamp and lighting assets valued at £11,161,166. On 1st June 1964, Atlas was renamed British Lighting Industries Ltd. in anticipation of the amalgamation and on 10th September 1964 its capital was increased from £100 to £6·5m to provide for the acquisition of Thorn's lamp and lighting assets. In December 1964 the capital was further increased to £10m for the purpose of acquiring the issued capital of AEI's subsidiary, AEI Lamp & Lighting Co. Ltd. (AEI L & L). Three agreements were concluded on 31st December 1964. The Sale Agreement provided for the sale by AEI of AEI L & L, whose net assets at 31st May totalled £10,246,837 of which £6,009,859 was to be satisfied by the allotment of 3·5 million ordinary shares in BLI, leaving the balance of £4,236,978 outstanding as a loan from AEI to AEI L & L. After the Sale Agreement the shares in BLI were, accordingly, held as to 65 per cent by Thorn and 35 per cent by AEI. The Inter-Party Agreement covered arrangements for the transfer to BLI of interests in other companies, including Thorn's interest in Ekco, and for the repayment to AEI of its loan to AEI L & L by ten equal annual instalments, free of interest to 1969 and thereafter with interest at the then current bank rate. The Working Agreement gave Thorn, so long as it held not less than 65 per cent of the issued capital in BLI, the right to nominate six directors, including the chairman, and also to nominate the secretary, and it gave AEI the right to nominate three directors. Thorn was to be responsible for the management of the company and would be re-imbursed for the cost. There were the provisions normal in such cases which barred Thorn and AEI from engaging in the manufacture or supply of lamps and lighting products, and others which granted BLI non-transferable licences in respect of patents, applications for patents and registered designs relating to lamps and lighting products which were owned or controlled by Thorn or AEI. It was also provided that neither party would, during the period of ten years from 31st December 1964, dispose of any of its shares in BLI without the written consent of the other party.

211. AEI L & L brought into the BLI group its existing interests in the component companies, Glass Bulbs, Lamp Caps, GTC and Lamp Metals, which it owned jointly with GEC (see paragraph 11). It also brought in its interests in the Controlled Companies (see paragraph 9), in certain wholesale distributors and its

interests in certain overseas lamp companies in which it had interests with GEC, NV Philips and Crompton.

212. For so long as it was a subsidiary of AEI, AEI L & L was joined in certain patent, technical assistance and know-how agreements with Osram GmbH, Germany; NV Philips, Holland; and General Electric, USA. The merger presented obstacles to the continuance of these arrangements as Thorn had a similar association dating from 1948 with Sylvania Electric Products Inc. (Sylvania), a division of General Telephone and Electronics Corporation, USA* a competitor of the overseas companies mentioned. In the event, AEI L & L retained licences to use for their life certain patents granted under the agreements with Osram GmbH, NV Philips and General Electric, but its participation in the agreements was terminated. Thorn's arrangements with Sylvania continue and the patents licensed to Thorn by Sylvania were licensed to BLI. AEI L & L also had a technical interchange agreement with GEC which ceased to operate in 1964 and has since been formally terminated.

213. *The sale to Thorn of AEI's interest in BLI.* On 20th October 1967 the issued share capital of BLI was increased by £7m to £17m by the creation of seven million £1 ordinary shares, ranking *pari passu* with the existing ordinary shares. The sum of £7m, being part of the amount then standing to the credit of the company's share premium account, was capitalised and applied in full to paying up the additional seven million shares. On the same date, Thorn acquired the interest of AEI in BLI which thereupon became a wholly-owned subsidiary of Thorn; the consideration paid to AEI was £12,020,000. The Inter-Party Agreements and the Working Agreement between Thorn and AEI continue in force, with minor amendments.

214. *The present organisation of the group.* Until 31st March 1968 (as it remains) BLI was a holding company for the group and acted as management company and operated the principal factories and research and development establishments. Until 31st March 1968 it sold only a very small proportion of the reference lamps manufactured in the group. From 1st April 1968, all manufacture, except for some second brand lamps, the sale of main brand lamps and all research and development has vested directly in BLI, as such. BLI has eleven wholly-owned subsidiaries and interests, through AEI L & L, in twelve other United Kingdom companies, including the Controlled Companies, the four component companies owned jointly with GEC and the two electrical wholesalers in which GEC also has interests. It has wholly-owned manufacturing subsidiaries in Australia and New Zealand and interests in manufacturing companies in Norway, the Irish Republic, Germany, Italy, India, Pakistan and South Africa. Under agreements dated 31st January 1966 AEI L & L sold to its fellow shareholders GEC, NV Philips and Crompton its interests in manufacturing companies in Australia, New Zealand and South Africa, where Thorn had had lamp manufacturing interests which accrued to BLI.

215. BLI's wholly-owned United Kingdom subsidiaries, with their respective principal functions, are:

Atlas Lighting Ltd.—sale of 'Atlas' brand products.†

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*General Telephone and Electronics Corporation has a 23 per cent holding in the ordinary shares of Thorn and a 12 per cent holding in the ordinary 'A' non-voting shares.
†But see paragraph 227.

AEI Lamp & Lighting Co. Ltd.—sale of 'Mazda' brand products* and the holding of investments.

Ekco Lighting Ltd.—mainly sale of 'Ekco' brand products*.

Omega Lampworks Ltd.—manufacture of filament lamps and sale of 'Omega' and 'Nura' brands and of customers' own brands, mainly single-coil GLS filament lamps.

Astralec Electrical Industries Ltd.—sale to Woolworth of 'Vesta' brand, mainly single-coil GLS filament lamps.

Lamp Presscaps Ltd.—manufacture and sale of bi-pin caps for fluorescent lamps.

Elgar Research Laboratories Ltd.—manufacture and sale of fluorescent powders and cathode coatings.

Manifold Machinery Co. Ltd.—manufacture and sale of lamp making machinery.

Smart and Brown Lighting Ltd.—manufacture and sale of lighting equipment and accessories, and very small sales of lamps mainly to fittings manufacturers.

Atlas Lighting Overseas Ltd.—holding company for overseas interests.

216. AEI L & L has a 50 per cent interest, with GEC as the other partner, in Stearn Electric, electrical wholesalers; a 10·5 per cent interest in Z Electric, electrical wholesalers, in which GEC has a 10·5 per cent interest and an investment company controlled by Thorn† has the major interest; and an 8 per cent interest, with GEC as the major partner, in Claudgen Ltd., manufacturers of neon signs. It has a 40 per cent interest, with Lucas (40 per cent) and GEC (20 per cent), in British Sealed Beams Ltd., whose principal business is the manufacture of sealed beam lamps for motor vehicles. Only about 4 per cent of this company's production is of reference lamps; these are mains voltage sealed beam spotlight and floodlight lamps, and are supplied only to BLI and GEC.

217. *Restrictive trading agreements.* BLI is a party to the following agreements which have been registered with the Registrar of Restrictive Trading Agreements:

Glass Bulbs Ltd. (jointly owned by AEI L & L and GEC)
On its formation in 1948, the shareholders agreed to purchase the products made by Glass Bulbs only from that company and, subject to certain exceptions, not to re-sell the bulbs so purchased. It was also agreed that the shareholders and their subsidiaries should be granted preferential terms (see paragraph 161).

British Sealed Beams Ltd. (owned by AEI L & L, Lucas and GEC)
On the formation of this company in 1959 it was agreed that the shareholders would purchase all their requirements of sealed beam lamps from the company and that the company would supply only the shareholders; and the types of lamps to be supplied to each shareholder were to be appropriate to the classes of business normally carried on by each.

Overseas companies
AEI L & L owns or has owned interests with GEC, NV Philips and Crompton in companies manufacturing reference lamps in India, Pakistan, Australia, New Zealand and South Africa. The purpose of the local factories is to supply firstly local requirements and secondly, where capacity is available, adjacent territories. Agreements provide that the parties will not import into those countries lamps of the types made by the local companies; similarly, there are, technically, restrictions against imports into the United Kingdom from the local companies. BLI has said that such imports would, however, be wholly impracticable.

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*But see paragraph 227.

†Thorn's interests in electrical distributors are shown in appendix 3.

BLI told us in August 1967 that it now realised that the arrangement for the sale of lamps to the Controlled Companies was probably technically registrable. It told us in July 1968 that it was considering whether or not certain additional arrangements disclosed during our investigation might possibly have been liable to registration under the Restrictive Trade Practices Act.

218. *Production.* BLI has told us that within a year of its formation the combined total of eleven lamp factories brought into the group by the merger had been reduced to nine; types and groups of lamps were concentrated in particular factories where the plant and skills existed, and two factories were closed. A third factory was closed in 1967, following further reorganisation. The locations of the remaining eight lamp factories, and the products made in them are:

Buckie	Special GLS lamps
Preston, Kent Street	GLS lamps
Preston, Fylde Road	GLS lamps
Merthyr	GLS lamps
Enfield	Fluorescent lamps, tungsten halogen lamps
Leicester	High wattage GLS lamps, mercury and sodium discharge lamps
Tottenham	Tungsten halogen lamps, projector lamps
Wimbledon	GLS lamps

The factory at Wimbledon is owned and operated by Omega; this subsidiary's simplified range of single-coil domestic type GLS lamps is made in bulk at other BLI factories on main brand production machines. Omega makes short runs of GLS lamps and certain special types of main brands of filament lamps. Most of the single-coil domestic type GLS lamps supplied by Astralec to Woolworth are made at Merthyr, generally on main brand production machines.

219. BLI makes a wide range of lamps of each of the descriptions in our reference. All the reference lamps sold under the main brand names of Mazda, Atlas and Ekco, and, except for fluorescent lamps, under the second brand name Omega, are the subject of a BSI licence, where such licence arrangements exist for the type of lamp. BLI told us that Omega had recently applied for a BSI licence and got it with no trouble. The BSI 'Kite' mark (see paragraph 17, footnote) is not used on any of the BLI brands which are the subject of a BSI licence, and BLI said 'We would rather stand on our own quality standards than rely on being classed according to British Standards requirements. On some items we use Kite marks—on fluorescent control gear'. The second brand Nura filament lamps supplied to supermarkets and the like, the Vesta brand filament lamps supplied to Woolworth and filament lamps bearing certain other customers' own brand names are not the subject of a BSI licence. BLI said that the only differentiation made in the production of filament lamps between its second brand lamps that are covered by a BSI licence and those that are not 'is the important one of filaments used'. It explained that the BSI specifications call for tight control of such matters as wattage tolerances and light output as well as life tests, and it said

> There is inevitably a spread in the characteristics of the filaments prepared for lamp manufacture, and it is our practice to test samples of the filaments to establish the quality of the different batches. We then use the best of such batches for brands the subject of BSI licence. If there are batches which are high or low in lumens we use them for [brands not covered by BSI licence] since, although they will make satisfactory lamps, some will fall outside the limits of the BS specification. We would not use filaments which were high in lumens since these would result in short life lamps.

220. About 60 per cent of the group's production of its main brands of GLS lamps is of the coiled-coil type. Single-coil main-brand GLS lamps are made in the same wattages as the coiled-coil lamps to meet the demand which exists for these lamps. The group's production of second brands of GLS lamps is almost all of the single-coil types. Until about November 1967 the cartons containing individual Mazda brand pear shaped coiled-coil GLS lamps bore the description '20 per cent more light' irrespective of the wattages of the lamps, and a similar description, irrespective of wattages, was included in the Mazda catalogues. As shown in appendix 8, table 7 the difference in the initial light output of pear shaped coiled-coil GLS lamps compared with that of pear shaped single-coil lamps is 20 per cent in the case of 40-watt lamps only; it is 15 per cent at 60 watts, 8 per cent at 100 watts and 3 per cent at 150 watts. When we drew BLI's attention to the description on the cartons, it explained that 'originally the legend was "up to 20 per cent more light" but unfortunately Publicity Dept., in re-designing the cartons, left out the words "up to" and repeated the error in catalogues. The mistake is being corrected.' BLI supplied a sample of the corrected design in which the words 'up to' precede '20 per cent more light'. Cartons for Atlas and Ekco brand pear shaped coiled-coil GLS lamps have always borne the brand name without any other description. Also as shown in appendix 8, table 7 the initial light output of the internally white-coated mushroom coiled-coil lamps give about 8 per cent less light than pear shaped coiled-coil lamps in all the wattages in which they are made, and less light than pear shaped single-coil lamps at 100 watts and 150 watts. BLI told us that the demand for the mushroom lamp exists because of its diffused light, modern shape and small size. It agreed that not only is the initial light output of the lamp less than that of pear shaped coiled-coil lamps, but the maintenance of the light output throughout life is less good than that of the pear shaped coiled-coil and single-coil; it explained that this is due partly to the increased heat resulting from the small size, and partly to the light absorption of the internal silica coating. It said, however, that 'mushroom lamps are not really intended to be used in the same circumstances as normal single-coil or coiled-coil pearl or clear lamps. For instance in enclosed fittings there is no point in using mushroom lamps . . . [the lamp] is primarily a domestic semi-decorative lamp and its main value is where the bulb is exposed. It is a nice, pleasant, small shape'. In reply to our inquiry as to what information is given to the general public about the lower light output of the mushroom lamp, BLI said that information about efficiency of the lamps is readily available to anyone who asks for it. Few inquiries, if any, had been received from the general public about efficiency; 'the fact is that the public are very indifferent to what they get. Lamps are purchased very infrequently. By the time the public purchases a new lamp they have forgotten about the last purchase. It is very hard to get over anything technical to them. Some years ago, we put a lot of advertising into coiled coil and this secured acceptance for it. However, from our point of view, as there is a strong case in favour of coiled coil we thought we could do the best job by making the price the same (as single coil) and encouraging the trade to handle coiled-coil lamps'.

221. All the GLS lamps made in the group are made to the relevant BSI specification which specifies an average life of 1,000 hours, apart from the 'Pluslife' lamps made by Omega which are guaranteed for an average life of one year or 2,500-hours burning life, and 2,500-hour lamps made to the IEC 64A specification (see paragraph 3) for export to Norway. Omega first introduced the Pluslife lamp in 1952, that is, before the company was acquired by Thorn in 1957. The specification used does not comply with the IEC 64A specification for 2,500-hour

lamps and is Omega's own. BLI has said that the IEC specification imposes limits as to dimensions which Omega does not at present wish to adopt. We drew BLI's attention to certain claims made in Omega's promotional leaflet about these lamps. BLI explained that the leaflet was a reprint of an earlier one and that it had decided to withdraw it and reprint it 'on a better basis'. The new leaflet, of which we have seen a proof, omits the particular claims to which we had drawn attention. BLI agreed that an increase in life without a marked reduction in light output can always be achieved by increasing the electricity consumed by the lamp, and it admitted that the actual wattages of the Pluslife lamps are 'deliberately designed towards the upper limit' of the normally permitted tolerance. It is said that the Pluslife lamps aim to give approximately the same light output as specified in the BSI specification for 1,000-hour GLS lamps but double the life.

> In order to do that, due to the lower efficiency of such longer life lamps, the objective wattage of the lamp design has to be at least at the top limit of what is permitted by BS 161 for individual lamps—i.e. 104 per cent of the rated watts. This means that a high proportion of the lamps must fall outside this top limit. Pluslife's present maximum for permitted watts for individual lamps is 106 per cent. For a normal distribution within a batch this probably means that half the lamps fall within the BS limit and half outside.

BLI told us that when it was invited to tender to the NCB and the BR for long life lamps to the NCB 241/64 2,000-hour specification it offered to supply to the IEC 64A 2,500-hour specification as it felt that 'if there had to be a long life lamp it was much better that it should conform to the international specification rather than to a completely new one which was coined over here'. Asked whether it did not feel that the volume required by the NCB justified the production of a special lamp, BLI said 'If they want a long life lamp they can have it. However, we felt we did not want a completely new specification which did not line up with anything else. We hoped we could encourage them to go for our IEC 64A specification (lamp) but we were not successful'. BLI's further comments on long life lamps are in chapter 11.

222. About 20 per cent of BLI's home sales of main-brand GLS lamps are 250 volts. It told us that it thinks that some users who have voltage trouble use 250-volt lamps on 240-volt supply to minimise the deleterious effects of voltage fluctuations; it suggested that some other users who wish to obtain increased life solve the problem by using 250-volt lamps. Some retailers in areas where they knew there was voltage trouble might be stocking 250-volt lamps. BLI said it had no evidence that the general public were asking for the lamps; on the other hand, the quantity sold exceeded what might be expected from the number of places still connected to supply at 250 volts (see paragraph 16). BLI also said that there was evidence that over-volting in supply had recently 'decreased enormously' and that voltage supply conditions were better now than they had been in the past. We asked BLI whether there was a particular demand for 250-volt lamps in certain areas, or whether demand was spread fairly evenly over the whole of the country. BLI told us that there were noticeable variations in the proportions of sales of 250-volt lamps to total sales and also, in a given area, in the proportion applying to each of its three main brands. Of the areas served by its regional depots, the North East (Newcastle), North West (Manchester), Yorkshire (Leeds) and Scotland (Glasgow) were well above the national average, the outstanding case being Scotland at 46 per cent (Mazda brand) to 78 per cent (Ekco brand). In the Eastern, Southern and Western regions, the proportion of 250-volt lamps was considerably lower at about 8 per cent to 10 per cent. The Midland region was at about the national average. On question as to advice given to customers

about the advantages or disadvantages of under-running, BLI said that, in general, if customers experienced shortened life due to terminal voltages in excess of the declared voltage, it advised them specifically to use 250-volt lamps. In addition, the effect of running lamps at lower than rated voltage was widely known amongst trade and commercial and industrial users, and the information was given in certain BLI publications, including its manual 'Lamps and Lighting' prepared by its technical staff.

223. We also asked BLI what information is given to the general public about the total current consumed by fluorescent lamps and the control gear required for their operation. BLI said that the manufacturer can do no more than indicate the nominal wattage of his lamps when operated on standard control gear.

> In practice the control gear can vary from resister type ballasts consuming as much electricity as the tube, to highly efficient choke coils consuming less than 20 per cent of the wattage of the tube; and without knowing the exact type and source of supply of control gear it is impossible for the manufacturer to give useful information about the current consumed. In the case of BLI, the vast majority of fluorescent fittings are sold to commercial and industrial users and full technical information about the products, including the current consumed by the control gear, is widely disseminated to such customers in the group's catalogues of control gear and in its technical publications.

As shown by BLI, the total wattage, including watts lost in control gear, of a representative type of 4-ft 40-watt fluorescent lamp and fittings, and of a 5-ft 80-watt fluorescent lamp and fittings, when used on representative standard BLI circuits, are as follows:

	4-ft 40-watt	*5-ft 80-watt*
Single tube with switch start	50 watts	94 watts
Single tube with switchless start	53 watts	99 watts

BLI pointed out that when a manufacturer sells a lamp for replacement, he has no control over the auxiliary gear with which it will be used.

224. *Lamp making machinery.* Advanced techniques are used for the manufacture of the bulk of reference lamps produced by the group. BLI has said that in 1951 a typical group of machines comprising a 'unit' for the production of GLS lamps cost about £37,500, required seven to eight direct labour operatives (i.e. excluding packing) and produced 1,500 lamps an hour. At the time of the formation of BLI in 1964, the GLS units in use, known as Phase II, produced about 1,500 to 1,750 lamps an hour with seven direct labour operatives. By 1957, some 30 per cent of the high speed GLS units in use at the Fylde Road, Preston and Merthyr factories were of a later type, known as Phase IIa; these produce at the rate of 2,000 lamps an hour with three direct labour operatives. BLI has developed a unit known as Phase III, costing about £165,000, which, when fully commissioned, is capable of producing at the rate of 4,000 lamps an hour with two direct labour operatives. This development is now past the pilot stage, and the first unit is installed at the Merthyr factory and is now producing the popular 60- and 100-watt coiled-coil GLS lamps at the rate of about 3,200 packed lamps an hour. BLI has also said that the two horizontal types of units for the manufacture of fluorescent tubes installed at the Enfield factory can each produce 3,000 packed lamps an hour with fifteen operatives compared with 850 packed lamps an hour produced by its earlier type of vertical unit which requires sixteen operatives. Almost 85 per cent of BLI's lamp making machinery is designed and made by its subsidiary, Manifold Machinery Co. Ltd., at that company's works at Enfield and Leicester. Day-to-day maintenance is carried out at the various lamp factories

and major overhauls are undertaken at Manifold's own works. Sources of equipment obtained from outside the group include Sylvania Electric Products Inc., USA.

225. *Components.* Filaments for lamps are made at the Merthyr and Leicester factories. Phosphors are made at Enfield by Elgar Research Laboratories Ltd., partly from chemicals made within the group and partly from supplies obtained from various chemical manufacturers. Bi-pin caps for fluorescent tubes are made by the subsidiary, Lamp Presscaps, at its factory at Edmonton. Other major components are obtained from the following suppliers: machine blown glass bulbs from Glass Bulbs; mouth blown glass from GTC and two small specialist suppliers; vitrited caps from Lamp Caps and NV Vitrite; glass tubes for fluorescent lamps from GTC and Chance Bros.; glass tubing and rod from GTC and Chance Bros.; various descriptions of wire from Lamp Metals and Mullard and, where necessary, other European sources; and industrial gases from British Oxygen Co. Ltd. and Air Products Ltd.

226. *Distribution.* The general arrangement for main brands is that reference lamps are transferred from the factories to the group's bulk warehouses and from there to the depots situated up and down the country. The 41 depots brought into the group by the merger had been reduced to 38 by 1966 and it is the intention to reduce this number to not more than nine. In general, each depot has stocked only one of the main brands, but BLI has said that it is moving towards a position where depots will stock all its brands other than the Vesta lamps for Woolworth for which a separate warehouse is reserved. There are at present separate depots for lamps sold by Omega.

227. Until April 1967 separate sales organisations, including design offices, publicity and marketing departments as well as distribution, were operated for each of the main brands. Separate sales forces are still maintained, but the other activities concerned with sales and distribution have been merged and are handled by a commercial division of BLI formed for the purpose. There are now two divisional managers (North and South) with overall responsibility for all sales; nine regional and 17 field managers, with a sales force of 206 representatives. Technical sales support includes a technical sales manager, eight field managers, 63 sales engineers and 40 lighting engineers. This total sales force is concerned with sales of main brands of lighting fittings and accessories as well as sales of lamps. The financial work of the three main-brand companies, AEI L & L, Atlas and Ekco, is now centralised in BLI, and apart from sales to certain large direct contract buyers, such as government departments ordering under Ministry of Technology contracts and the GLC, they have ceased to trade. BLI has said that this centralisation has made for economies both for the group and for buyers since one invoice and one statement can now cover transactions relating to one or all of the main brands of lamps. The second-brand companies, Omega and Astralec, continue to trade independently.

228. *Sales.* For the three years to 1967, total net sales by the group of its own production of the descriptions of lamps covered by our reference were:

	(£'000)	(£'000)	(£'000)
	1965	**1966**	**1967**
Filament	5,913	6,239	5,858
Discharge and fluorescent	4,287	4,523	4,545
Total	10,200	10,762	10,403

For each of the years shown above, the approximate proportions of the totals sold to the four main classes of buyers were:

	1965 (%)	1966 (%)	1967 (%)
To wholesalers	51	53	54
To retailers (including Woolworth and electricity boards)	20	17	16
To users (including government departments)	25	22	26
To other manufacturers	4	8	4
	100	100	100

Sales of main brands accounted for about 82 per cent of the total net sales of £10,403m for 1967; sales of second brands (including those for Woolworth and electricity boards) for about 13·5 per cent; sales to the Controlled Companies of their brands for about 2 per cent; and sales to other manufacturers of their brands for about 2·5 per cent.

229. *Prices.* BLI sells reference lamps, mainly main brands, to over 500 wholesalers who are 'appointed', as are certain projector and apparatus makers and certain street lighting fittings makers and erection contractors. BLI has explained that the description 'appointed' means that its sales organisation has been satisfied that the prospective customer, apart from the relevant 'customer definition', is credit-worthy and likely to contribute to an improvement in sales and distribution coverage. The form of application for 'appointment' is completed by the local sales organisation after discussion with the prospective customer and the 'appointment' requires the approval of the central sales office. The 'customer definitions' for wholesalers and retailers used by BLI are those of the ELIC Discount Schedule of 1960 (see appendix 8, table 6), and until 1st April 1967 the discounts on main brands allowed by BLI to the various classes of distributors as defined in the Discount Schedule were substantially the same as those of the ELIC discount structure of 1957 and generally the same as those allowed by the other members of ELIC. BLI's lists of wholesalers were graded according to total purchases of all brands of lamps from all sources and it has told us that the exchange of information through ELIC had enabled it to keep its lists up to date in this respect. Where BLI delivered direct to users (other than local authorities), the wholesaler's discount was reduced by five per cent to cover the cost of delivery except when fluorescent tubes were packed with fittings or accompanied by fittings for initial installation; the company did not deliver to local authorities on behalf of wholesalers. BLI told us that towards the end of 1966 'in consequence of the acute nature of current competition', it allowed special additional discounts to a few wholesalers ranging from five to seven per cent.

230. BLI continues to classify commercial and industrial users in accordance with the ELIC Discount Schedule of 1960 and until recently the discounts it has allowed on main brands have been generally the same as those of the other principal manufacturers. It told us in 1966 that it was allowing special terms to ten users in the classification for users with established annual lamp purchases of £10,000 and over to which a discount of 37½ per cent off list price normally applied. In some of these cases, BLI had received notification from ELIC of special terms granted by other members and it had thereupon matched those terms; in other cases, it had introduced the special terms and had notified ELIC in the following month. It told us that the reasons for allowing the special terms, which ranged

from list less 40 per cent to list less 45 per cent plus a rebate, were to meet competiton and retain its share of the business or to obtain the business from competitors. We understand from BLI (and also from the other principal manufacturers) that, at least until quite recently, only a few large contract buyers were in a class to which it was generally recognised that the Discount Schedule did not apply, and for whose business price competition was very keen. This small group included the government department responsible for placing the main government contracts (now the Ministry of Technology), the NCB and (since its formation) the GLC. The members of ELIC, including BLI, told us early in 1967 that as far as main brands were concerned, apart from the small group referred to, due to product similarity competition between them was in fields other than price—that is, in quality and service. The changes in the trading arrangements of BLI and the other principal manufacturers which have taken place since 1st April 1967 are set out in paragraphs 308–325.

231. Until 1st April 1967, Mazda, Atlas and Ekco brands, in common with the main brands of the other members of ELIC, were price maintained at all stages of supply. BLI told us that price cutting of its main brands was rare and a simple warning was generally sufficient to induce the trader to comply with the conditions of sale. Since the members of ELIC abandoned resale price maintenance on 1st April 1967 the resale prices of BLI's main brands have been recommended. BLI's retail list prices and those recommended or published by the other principal manufacturers for their main brands are virtually the same, type for type, and are substantially the same as those ruling at the time of the formation of BLI, apart from price reductions made by BLI in May 1968 in respect of tungsten halogen lamps and in June 1968 in respect of projector and photo lamps.

232. No resale price maintenance conditions were applied by BLI to lamps supplied under brand names other than Mazda, Atlas and Ekco, and no discount structures for other brands are or have been published by BLI. Most of the lamps supplied under other brand names, whether BLI's second brand names, Omega and Nura, or the 'own brand' names required by a few wholesalers and by Woolworth, electricity area boards and other retailers, are of the domestic type of GLS lamps. Omega sells some fluorescent lamps which until recently it obtained from small manufacturers of these lamps but which are now obtained mainly from BLI. Its business in these lamps is said to be developing. The retail list prices published for Omega brand lamps other than the Pluslife type are the same as the retail list prices of corresponding types of main brand lamps but few, if any, are sold by retail; the lamps are sold almost entirely direct to large users, including local authorities and nationalised industries, at discounts off the list prices or negotiated net prices which result in lower average net realised prices than those obtained by BLI on its main brands. BLI has told us that before 1st April 1967 customers for the Nura brand, who are super-markets and grocery chains, were asked to maintain the retail list prices indicated by Omega; if the obligation was not carried out, the customer's attention was drawn to the matter and this generally produced the desired result. The retail prices indicated by Omega for Nura lamps were (and are) the same as those of corresponding types sold by Woolworth. Omega's selling prices are negotiated on the basis of quantities required. The retail list prices of the Omega Pluslife lamps are higher than those of the corresponding wattages of 1,000-hour main-brand lamps, and BLI has told us that the Pluslife lamps are more expensive to make as the filaments have additional supports and the lamps are made on slower machines than those used for main

brands. So far as we know, no Pluslife lamps are sold by retail to the general public. The lamps are sold, at negotiated prices according to quantity, direct to independent hospitals, schools and the smaller industrial users, and also to a few wholesalers under their own brand names. No retail prices of the Vesta lamps supplied by Astralec to Woolworth have been or are suggested to Woolworth, which has always fixed its own selling prices. Net prices are negotiated by the Universal Distributing Co. Ltd. (see appendix 1, paragraph 13), which acts as agent for sales to Woolworth and carries out invoicing and other accountancy work for a fixed fee and a commission on the sales. The net prices to Woolworth are exclusive of carriage and delivery costs from BLI's special warehouse to the individual Woolworth's stores; these costs are paid separately by Woolworth.

233. The retail list prices of some popular types of the principal manufacturers' (including BLI's) main brands and second brands of lamps covered by our reference are shown in appendix 8, table 1.

234. *Inter-trading with other manufacturers.* In the year ended 31st March 1967 the BLI group's sales of reference lamps to other manufacturers bearing these manufacturers' brand names totalled £876,000 of which filament accounted for £427,000, fluorescent £361,000 and discharge £88,000. In the same year purchases from other manufacturers of lamps bearing BLI's brand names totalled £534,000 of which filament accounted for £327,000, fluorescent £69,000 and discharge £138,000. BLI said that, in view of the complexity of the lamps industry (it estimated that something like 5,000 items, including non-reference types, are offered by the group), it welcomes inter-trading as a means of keeping down manufacturing costs by increasing the factory loading of items not in regular production or produced in small quantities. For example, it said that, of the group's purchases of filament lamps in 1966/67 about 55 per cent was of types in small demand which are made in the group, but were not in stock nor scheduled for production at the time of receiving an order. The other 45 per cent of filament lamps purchased consisted of lamps obtained from specialist manufacturers of decorative and other non-standard types. About 60 per cent of total purchases of fluorescent lamps was obtained from Sylvania where the special types or export market requirements made this convenient, and about 20 per cent consisted of the fluorescent lamps bought by Omega from other small manufacturers. Almost all the purchases of discharge lamps were accounted for by sodium lamps bought in the circumstances outlined in paragraph 199. BLI has said that the prices and terms at which it purchases from or sells to other manufacturers, apart from the Controlled Companies (see chapter 6), are invariably negotiated individually with each manufacturer concerned.

235. *Discussions or consultations with other manufacturers relating to prices of reference lamps.* BLI told us in July 1966 that it had no arrangements with other suppliers or with trade associations for the discussion of terms or prices relating to reference lamps.

> The group from time to time has meetings with other suppliers to discuss various matters affecting the industry. On occasions prices and terms have been discussed and the group or other manufacturers have indicated a course of action that they were intending to adopt. The group has noted what other lamp manufacturers were intending to do but there have never been any agreements or arrangements as to the course of action the group should adopt. As has already been said this is a matter for the group itself to decide and any decisions that have been made by the group have been made in the light of what the group or the individual members of the group consider to be in its best commercial interest. As regards distributive trade associations

which represent the views of the group's customers the group is always willing to meet such trade associations, and has done so on a number of occasions for the purpose of hearing any views on prices or discounts which the association wishes to put before the group. The group has of course listened to representations which have been made by these associations but there have been no arrangements reached with the association, the group unilaterally deciding the prices to be charged or discounts to be allowed which seemed to it best for its own commercial interest. The group has no arrangements with other suppliers or customers for giving prior notice of price or discount changes. The group does of course, before the effective date of a price or discount change, give its customers short prior notice of the change. The group also when it has decided on a price or discount change normally informs its competitors of its decision and the date when the change is to be effected.

236. On our further inquiries about the statement quoted above, BLI said:

> So far as the group is aware, since 1961 prices and discounts have never been discussed at ELIC meetings. After such meetings have terminated members often lunch together and not unnaturally informal discussions have on occasion taken place. Representatives of manufacturers frequently find themselves together at other industry meetings, after which similar discussions have taken place. In addition representatives of ELIC manufacturers also meet as directors of jointly owned undertakings engaged in making reference products and in making components to service the lamp industry. On these occasions, it is inevitable that matters of general interest, which may on occasion have included price levels of completed products, have come under similar consideration.

BLI has also said:

> In a competitive industry such as the lamp industry no manufacturer can increase his prices unless the other manufacturers follow suit. If they do not, for obvious competitive reasons, the manufacturer increasing his prices has subsequently to reduce them. For this reason it is common practice in the lamp industry, and indeed most other competitive industries, for a manufacturer who is intending to increase his prices to sound the market. If it appears that other manufacturers will follow suit then the manufacturer in question increases his prices. If however it appears that others may not follow suit he does not do so.

237. *Patents, research and development.* BLI has told us that its policy is to grant non-exclusive patent licences on reasonable terms to those who require them. The royalty rates on two patent licences granted relating to reference lamps are 4 and 3 per cent, respectively. At the present time, it has or is licensed under a large number of patents of which seven are of major importance to the group; one relates to the braided cathode, one to a new construction of sodium lamp and one to electric-luminescent panels. The other four relate to tungsten halogen lamps; two were of importance at the time of filing but have to some extent been superseded by later developments. BLI has or is licensed under patents on certain sections of its Phase III GLS production unit (see paragraph 224). BLI has said that 'whilst patents are of importance, know-how in manufacturing lamps and developing processes and equipment to manufacture them is of the utmost importance. This importance of know-how applies generally to the manufacture of reference lamps'.

238. The benefits of Thorn's patent licensing and know-how agreements with Sylvania which accrue to BLI give BLI the rights to all Sylvania's relevant patents in this country, the Commonwealth and certain other countries; and the arrangements give Sylvania the rights to all BLI's patents for manufacture in the USA and Canada and for world wide sale. All the arrangements are free of royalties.

239. Under the AEI/Thorn agreements relating to the formation of BLI, BLI was able to call on AEI's research establishment at Rugby, which continued work on several projects concerned with reference lamps, which were already in

hand at the time of the merger in 1964, including work on high pressure sodium lamps. BLI's payments to AEI for this work amounted to £30,000 in the twelve months to April 1966 and £40,000 in the twelve months to April 1967. BLI told us that this source of research and development was closed to it when GEC acquired AEI in October 1967, but the essential part of the work and some of the people concerned with it had already been transferred to BLI.

240. BLI has said that it attaches the greatest importance to research and development; and that this policy is directed towards improving existing products and producing new and better ones, and also contributes substantially to improving and innovating manufacturing and application techniques which are of vital importance in the manufacture of lamps and their components. Its total expenditure on research and development relating to lamps of the types covered by our reference (including lamps for export) in the year ended 31st March 1967 amounted to £486,000, made up as to £225,000 on fundamental research, £45,000 on net costs of pilot plant and £216,000 for laboratory costs. Of the total sum we have allocated £387,000 (or 3·5 per cent of net reference sales) to reference lamps, details of which are shown in chapter 10, schedule 2. For the reasons stated in paragraph 475. BLI disputes this allocation and considers the charge to reference lamps for research and development should be £451,000 (or 4·5 per cent of net reference sales).

Osram (GEC) Ltd.

241. *History and organisation.* Osram is a wholly-owned subsidiary of GEC; it was formed in 1961 to manage GEC's lamp division and, subsequently, its lighting fittings interests. It markets 'Osram'* brand production in the United Kingdom. GEC has three other wholly-owned United Kingdom subsidiaries concerned with reference lamps and which are managed by Osram; these, and their respective principal functions relative to reference lamps, are:

Pope's Electric Lamp Co. Ltd. (Pope's)	A selling company, mainly for 'Elasta' brand products.
Ascot Lamps & Lighting Ltd. (Ascot)	A selling company, mainly for 'Ascot' brand products.
Lumifax Ltd.	Manufacture and supply of phosphors, mainly for fluorescent and other discharge lamps.

Ascot, originally named Tungstalite Ltd., was formed in 1923 as a private company. In 1924 the Stella Lamp Co. Ltd. (see paragraph 153, footnote) acquired a small interest in the company in consideration of the grant of the sole agency for the sale of Stella lamps in London. In 1957 the company was acquired by Radiation Ltd., through a holding company, Financial Holdings (London) Ltd., and the name was changed to Ascot. In January 1965 the company was acquired by GEC for a total consideration of £105,333. Ascot's sales of reference type lamps amounted to £394,300 in 1963 and £350,000 in 1964. Osram told us that GEC acquired Ascot to enable it to expand its business into the sector of the market served by Ascot in which Osram did not directly participate, and also to secure additional production for its factories to assist in meeting rising costs of labour

*GEC has the trade mark rights in the brand name 'Osram' in the United Kingdom and certain other parts of the world, particularly in Commonwealth countries. Osram GmbH has the trade mark rights for Germany and many other countries.

and services and provide increased usage of existing plant. (The sector of the market served by Ascot was and is what we have termed the cheap lamp sector.)

242. GEC has joint interests with BLI, Crompton and Philips in the Controlled Companies (see chapter 6), and with BLI alone in four components companies (see chapter 7). It has joint interests with Philips in Cryselco, and with BLI and Lucas in British Sealed Beams. It has interests in two wholesalers (see appendix 3). GEC has trading subsidiary and associate companies selling GEC products generally, including lamps made in its United Kingdom factories, or produced in some of the countries concerned in Canada, the Republic of Ireland, Australia, Hong Kong, Italy, New Zealand, Rhodesia, South Africa, Zambia, India, Pakistan, Malaya, Singapore, Nigeria, Argentina and Spain. In some of the associated companies, NV Philips and Crompton and in a few cases BLI also, are the other parties. None of these subsidiary or associated overseas trading companies is managed by Osram. GEC has recently established trading subsidiaries in Europe and the USA which handle lamps; these are managed by Osram.

243. *Production.* The locations of the lamp factories operated by Osram, and the types of reference lamps made at each are:

East Lane, Wembley	GLS lamps, special filament lamps including projector lamps.
Shaw, Nr. Oldham	GLS lamps, fluorescent lamps, sodium and mercury discharge lamps.
Team Valley Trading Estate, Gateshead-on-Tyne	High wattage filament lamps.

Special gases and filaments are made at the Wembley factory; fluorescent powders are made by Lumifax at that company's factory at Wembley. Glass components are obtained from Glass Bulbs and GTC; various metals and wires from Lamp Metals; vitrited caps from Lamp Caps; and bi-pin caps for fluorescent lamps from Lamp Presscaps. The bulk of the plant and equipment used in the manufacture of lamps is designed, built and maintained within the organisation.

244. Osram manufactures a wide range of each of the descriptions of lamps covered by our reference. The lamps are made to the relevant BSI specifications where these exist for the type of lamp, and those sold under the main brand names, Osram and Elasta, and under the second brand name, Ascot, are the subject of BSI licences where such licence arrangements exist for the type of lamp. Osram told us that it was only early in 1968 that it applied for and received a BSI licence in respect of Ascot lamps. (Formerly, the Ascot brand single-coil GLS lamps were claimed as made to BS161:56; they were made with one fuse instead of the usual two, and the gas filling had a higher nitrogen content, which was said to reduce slightly the luminous efficiency.) Like BLI, Osram does not use the BSI Kite mark on any of the lamps to which BSI licences apply. It said 'We feel that the brand name Osram has a sufficient reputation for quality and the Kite mark would only possibly confuse the consumer rather than lead him into the channels that we wish to lead him into to buy more Osram lamps. We do not see that there is any use in having the Kite mark'. It also said 'When we are tendering to public authorities or when asked by any user of lamps as to whether we have a BSI licence, we quote that licence and we have never considered the fixing of the Kite mark on the lamp or its package is of advantage to us'. It agreed that there might be a marketing disadvantage if both main brand and cheap lamps bore the Kite mark. The GLS lamps supplied to the Controlled Companies

and to four 'own brand' multiple retailer customers supplying cheap lamps are not the subject of BSI licences. These lamps are made on the same machines and with the same materials as the Osram, Elasta and Ascot brands; Osram has said that the only difference is in the degree of quality control exercised.

245. The bulk of production of the main brands of GLS lamps is of the coiled-coil type and of the second brands is of the single-coil type. (In the case of the Osram brand about 87 per cent is coiled-coil and in the case of Ascot about 83 per cent is single-coil.) All the GLS lamps made in the group are made to the relevant BSI Standard for lamps with an average burning life of 1,000 hours apart from the Ascot 'Extended Life' lamp, which is made to the IEC 64A 2,500 hours specification. This lamp was introduced by Ascot in 1963 (that is, before the company was acquired by GEC). As far as the wattage tolerance of the lamp is concerned, Osram has told us that its production target for the Extended Life lamp, as well as for its main brands of GLS lamps and the Ascot GLS lamps, is the nominal wattage (that is, the wattage marked on the lamp), and that its quality control records show that this is the average achievement. Osram told us that, when it was invited to tender to the NCB and to BR for long life lamps to the NCB 241/64 2,000-hour specification, it did not quote because it had no wish to develop and manufacture yet another range of GLS lamps; and it added that this policy could change depending upon the growth of overall demand. Osram's further comments on long life lamps are in chapter 11.

246. Over 17 per cent of Osram's total sales of GLS lamps, all brands, is of 250-volt lamps. Osram said that the over-volting of supply which does occur may knock 100, 200 or 250 hours off the life of a lamp. 'It is customary for the customers who experience this and know about it—and of course they will not know about it until it has been checked at their premises—to buy lamps of a higher voltage to compensate for that.' Osram also said 'This is another way of achieving long life. It is a way open to people to obtain it'. As regards the question whether any special advice is given to customers in areas where lamps are short-lived, due to operating conditions, such as hard usage, excessive vibration etc., Osram said that it has recommended the use of 250-volt lamps on 240-volt supply but its normal practice is to advise consumers to use Rough Service lamps.* As regards areas where voltage fluctuations are known to be excessive, Osram said 'In such areas the retailer will often stock 250-volt lamps and supply them to customers who come in and just ask for a bulb, because very few people specify the voltage of the bulb they require . . . I do not think one should exaggerate the extent to which there is overvolting. There is a good deal of it but the supply industry of this country does a very good job, first of all in its ever increasing standardisation on 240 volts, which is excellent compared with continental countries'. Osram told us that a large proportion of its sales of 250-volt lamps was supplied to Scotland but the general demand came from every area. It thought that demand for 250-volt lamps in order to obtain longer life is more likely to come from industrial users than from the general public. A director of Osram said 'I do not think the average housewife or her husband is aware of the niceties of under-running and that using a 250-volt lamp on a 240-volt mains one could get

*Rough Service filament lamps are designed for use in conditions where vibration and shock are present. The single-coil filaments are made of special anti-shock wire and have additional supports. The light output of the lamps is about 15 per cent below that of standard single-coil GLS lamps. The list prices of Rough Service lamps are higher than those of standard GLS lamps, e.g. the list price (ex p.t.) of main brands of 100-watt Rough Service lamps is 2s. 9d. compared with 1s. 6½d. for the 100-watt GLS single-coil lamps.

a bit of extra life. I am not certain that the householder is in any way conscious of the life of the lamp used in the home'. Osram said that a Gallup poll it had commissioned in September 1967 into 'Attitudes to Light Bulbs' had shown that lamp life was in the category of 'also rans' which accounted for five per cent only of the considerations regarded by the 2,600 housewives canvassed as the most important when buying lamps; 32 per cent had thought price the most important consideration and 21 per cent had thought it was 'brightness'.

247. *Sales.* For the three years to 1967 total net sales by the group of own production of lamps of the descriptions covered by our reference were:

	1965	1966	1967
	(£'000)	(£'000)	(£'000)
Filament	3,290	3,314	3,457
Discharge and fluorescent	1,677	1,655	1,773
Total	4,967	4,969	5,230

Of the total sales in 1967, excluding sales to Cryselco, the approximate proportions sold to the four main classes of customers were:

	Per cent
To wholesalers	63
To retailers (including electricity boards and multiples)	18
To users (including government departments)	15
To other manufacturers	4

As regards sales by brands, of the total figure for 1967 main brands (including Cryselco) accounted for 78·5 per cent; sales of second brands for about 17·5 per cent; sales to the Controlled Companies of their brands for about 1 per cent; and sales to other manufacturers of their brands for about 3 per cent.

248. *Distribution.* There are eleven depots for the distribution of Osram lamps, and an order office at Southampton which processes customers' orders and sends them to the main depot at Wembley. There is one main warehouse for Elasta lamps and two regional depots, and three regional depots for Ascot lamps; these depots supply customers buying at recommended list prices less discounts. Sales to other customers, including those requiring own brands, are handled at Wembley.

249. *Prices.* Osram has said that its method of classifying wholesalers with purchases of £20,000 and over was introduced when ELIC was formed and the names of these distributors are listed by the association. Osram makes its own selection of wholesalers whose annual purchases are less than £20,000, and says that

> If any distributor in this or another category informs us that their total lamp purchases from all sources are such as to justify their transfer we ask ELIC Ltd. to collate the sales figures made by its members to the distributor and inform us whether the total sales so recorded indicate that the qualifying figure has been attained. This provides only a rough guide since other suppliers may be involved but unless we have doubts as to the applicant's ability to achieve the specified turnover, the transfer is made.

Until April 1967 the discounts allowed by Osram on its main brands to the classes of distributors defined in the ELIC 1960 Discount Schedule were substantially the same as those allowed by the other members of ELIC, but there were certain wholesalers and retail buying groups, whose numbers we were told increased in the past two years, to whom special terms were allowed often in the form of rebates. It has been the practice to negotiate the discounts or prices for some large orders for reference lamps; such arrangements could be linked with the

lighting fittings purchased for new installations. Osram has said that none of these departures from its trading structure was notified to ELIC or its competitors.

250. Osram told us that early in 1963 it decided it would make no direct deliveries to local authorities on behalf of wholesalers as there was a growing tendency among the few wholesalers then supplying local authorities with discharge lamps not to buy in bulk and not to stock against contracts secured, but to place orders, as received from local authorities, direct with Osram with instructions to deliver on behalf of the wholesaler. As regards other types of customers, Osram would undertake deliveries on behalf of wholesalers subject to a reduction of five per cent in the basic discount allowed to the wholesaler concerned. This matter was discussed at a joint EWF/ELIC meeting. After Osram had announced the change and notified it to ELIC, the other members of ELIC adopted the same arrangement.

251. A card index of commercial and industrial users, which is the 1963 ELIC list of trade users with amendments notified by ELIC, is held at each Osram sales office. Osram told us in January 1968 that 'the ELIC grading of trade users has almost gone by default. It tends to fall a little into the category of an indication as to the discounts we should provide, but it gives very little indication today to the wholesaler as to the discount he should give.' Osram also said 'As a guide to the wholesaler it can be no more than a very rough guide, because he will—and does—decide what terms he gives to the user so there could well be a difference between the lists we are operating, as representing discounts to our user customers, and the lists that wholesalers will be operating for the same buyers'. Again until April 1967, Osram's discounts to users, classified according to the ELIC 1960 Discount Schedule, were substantially the same as those of the other members of ELIC. Special terms were allowed to seven of the ten users to whom BLI allowed special terms (see paragraph 230); Osram said that these terms were notified to ELIC.

252. As regards a small group of large contract buyers (see paragraph 230), Osram told us in January 1968 that in the past these would have been quoted on a discount basis and, as the discounts were known at which other manufacturers were supplying, the discounts were in consequence matched. 'Today the situation is a little different. There is much more competition for some of these larger contracts and we tend to put in prices of our own making.' On being questioned whether there was a recognised area in which it felt at liberty to put in a competitive tender, Osram said 'It is not clearly defined but there is a record'. It told us that its terms to buyers in this small group were not notified to ELIC or to its competitors.

253. As we have said, the resale prices of Osram's main brands have been recommended since 1st April 1967, as have those of the Ascot brand; and the retail list prices of all three brands are virtually the same, type for type, as those of the other principal manufacturers' main brands except that the prices of some Ascot coiled-coil lamps are higher. Osram explained that this difference is not due to any difference in construction but is historical in that, when Ascot was acquired, the prices of all coiled-coil lamps were higher than those of single-coil and when the prices of both types were made the same the differential was retained in Ascot's case.

254. The standard trading arrangements operated by Osram since 1st April 1967 for its main brands are set out in appendix 8, table 6. The discounts allowed on Ascot lamps are generally higher than those for main brands and the net selling

prices generally lower; about 65 per cent of sales by Ascot is made to wholesalers and the other 35 per cent to a variety of other buyers. Customers' own brands of GLS lamps supplied to electricity boards, retail buying groups and grocery and ironmonger chains are sold at negotiated prices related to annual quantities and sizes of individual orders; they are retailed at prices which are the same as those of comparable types sold by Woolworth. Osram told us that there is no special promotion or explanatory literature for the Ascot Extended Life lamps; the lamps, which account for about 2 per cent of Ascot's sales of reference lamps, are promoted by the Ascot salesmen, who call on many types of customers. Osram explained that the principal customers and potential customers are mostly industrial concerns who, because of the inaccessibility of fittings and high labour costs of replacing lamps, accept a reduction in light output.

255. *Inter-trading with other manufacturers.* In 1967 Osram's sales of reference lamps to other manufacturers bearing those manufacturers' brand names totalled £214,000, including £58,000 in respect of sales to the Controlled Companies. In the same year, purchases from other manufacturers of lamps bearing the Osram, Elasta and Ascot brand names totalled £290,000. Of these purchases 48 per cent of the filament lamps and 12·5 per cent of the discharge lamps represented types not made by Osram; a proportion of the purchases will have been exported. Osram has said that the prices at which it sells to or buys from another major manufacturer are not the subject of general discussion with any other manufacturers but are settled between the seller and the buyer. It also said 'We do not put a tag on to the lamps we supply to other manufacturers that these must be supplied at our discounts or our prices', and it told us that it was prepared to sell to any lamp manufacturer provided the load was worthwhile. We drew Osram's attention to the fact that an Altas (Thorn) Board Minute dated 22nd February 1963 had recorded that GEC had been selling fluorescent lamps to non-members of ELIC but had now agreed that they would not supply these lamps to any non-members.* Osram pointed out that the record included a statement purported to have been made by an Osram representative. It said its fluorescent lamps had always been available to any non-ELIC manufacturers at standard trade terms, but it was not its policy to supply fluorescent lamps to such companies at special prices and make available products which were the result of its technical effort and might be sold at better discounts than it was currently offering to the trade. During the past two or three years it had changed its policy and had from time to time offered to supply non-ELIC manufacturers against inquiries, at special prices related to quantities.

256. *Discussions or consultations with other manufacturers relating to prices of reference lamps.* In July 1966 Osram said

> The company has participated in meetings with major shareholders of the Controlled Companies when prices and the terms of supply of General Lighting Service lamps supplied by the shareholders to these companies have been discussed. There are occasions when the company and the lamp industry, as represented by the Electric

*On being questioned about this record, BLI told us that Atlas had informed GEC that, in its view, the sale of fluorescent tubes to non-ELIC manufacturers 'was bad commercial practice. GEC agreed, and so far as is known, ceased the practice.' When we asked BLI why Atlas had considered it bad commercial practice, BLI said 'It seemed to us that the sale of main-brand fluorescent tubes was best confined to the main companies . . . to date the sale of fluorescent tubes made in our factories has been restricted to the main selling companies . . . The second brand companies have not been in this sector to any great extent. We felt it was undesirable for them to duplicate the main-brand tubes at lower prices.'

Lamp Industry Council, meet the Electrical Wholesalers Federation and any other representative body of customers. At such meetings, concerned with improving the efficiency of lamp distribution, some matters relating to resellers margins and realisations may be discussed.

In amplification of this statement Osram said in January 1968

It would be wrong to say that we do not meet together and as distinct from our ELIC meetings we do discuss the market and prices and discounts. We have discussed these with the Wholesalers through the EWF. If there is an intention to make a change, I would say that 70 to 80 times out of 100 it would be done. You might say the fact that there are 30 or 20 times when it is not done would imply that some resistance is encountered from the remaining competitors to the change. The fact is that in a complex business such as ours, with all the classifications of customers that we have and all the types of lamps we have, there are times when what appears to be a sensible change in trading policy can have considerable implications for the manufacturer concerned and it has happened on occasions that a hint of what might happen to the industry and his own business as a result of such a change had persuaded him perhaps, although he has not admitted it, not to go ahead with the intention which he had expressed.

257. *Agreements.* As already shown, GEC is a party to the three agreements mentioned in paragraph 217, which have been registered with the Registrar of Restrictive Trading Agreements, and is also a party to the arrangements whereby lamps have been supplied to the Controlled Companies by their shareholders in agreed quantities at agreed prices. GEC has agreements with General Electric, NV Philips and Osram GmbH for the licence of patents and mutual exchange of know-how and technical information, and Osram has said that these agreements do not restrict in any way the manufacture or supply of reference lamps in this country; neither do they restrict or inhibit in any way Osram's exports of lamps to those companies' home markets. Osram told us that there had been a 'very good balance between technical development in this country and in Holland and West Germany and America, hence the continuing of the interchange agreements'. An agreement with Claude Paz et Visseaux, France, which expired on 31st December 1966, granted Osram a licence relating to the French company's patents on discharge lamps; and it provided that the French company would sell products covered by the patents in the United Kingdom only at the prices at which the products were sold by Osram.

258. *Patents, research and development.* Osram does not consider patents to be of major importance to its activities, but the know-how which it has acquired through research and development expenditure over the past fifty years is considered to be of prime importance for almost all types of reference lamps but particularly so in the field of fluorescent, sodium and mercury discharge lamps. The company said that it has always been willing to grant patent licences, on reasonable terms, to reputable and competent manufacturers who may approach it. None of the 180–200 patents relating to reference lamps taken out by GEC or Osram over the last ten years, with one possible exception, could be regarded as giving Osram a major product advantage over its commercial competitors. The possible exception is a patent relating to halophosphate fluorescent powders. Osram has said that the patent, which has now expired, was covered by GEC's patent and know-how agreements with Osram GmbH, NV Philips and General Electric which permitted it to license the patents to other manufacturers. The patent had been licensed to Crompton. Osram said that the patent had, in fact, covered all halophosphate powders, but no action for infringement had been taken by GEC against other (unlicensed) manufacturers who had made the powders.

259. GEC first established a Lamps Research Group during the 1914–18 war, and this developed into what is now known as the Hirst Research Centre at Wembley. In addition, there are lamp development departments at the Wembley and Shaw factories which are engaged in designing new lamp types to meet market needs and in developing new production processes. A central quality control department is maintained at Wembley. Expenditure on research and development relating to reference lamps amounted to £187,000 in the twelve months to 31st March 1967 or 3·6 per cent of the total net sales; details are shown in chapter 10, schedule 2.*

Cryselco Ltd.

260. We deal here with the trading arrangements of Cryselco, owned jointly by GEC and Philips, as we understand that, although both parents are represented on the company's Board of Directors, the day-to-day management is handled by the company's executive and Osram is responsible for commercial direction. Cryselco, an independent lamp manufacturer established in 1895 which was acquired by GEC and NV Philips in 1927, was a member of ELMA and of ELIC, and is a member of ELIC Ltd. Until 1958 it manufactured filament lamps and purchased fluorescent and mercury and sodium discharge lamps from its parents. In 1958, it was decided to cease manufacture and the company has told us that 'the availability of filament lamps from the factories of the two shareholders was a profitable alternative to the capital investment needed for the replacement of ageing plant and the problem associated with the continued manufacture of a wide range of such lamps related to the Cryselco sales level'. Production was run down over a two-year period and finally ceased in 1960. The bulk of the company's requirements of reference lamps bearing the Cryselco brand name is obtained from the parent companies; some lamps are also obtained from BLI and from small manufacturers. Prices and discounts are now recommended, and retail list prices are generally the same, type for type, as those of the other members of ELIC. In 1967 Cryselco followed the changes in basic discounts adopted by the other members of ELIC. It has recently drawn up its own discount structure which combines certain of the features of the respective structures now operated by its parent companies.

261. Total net sales in 1966 amounted to £1,340,049, made up of £835,105 for filament and £504,944 for discharge and fluorescent. The company has a main warehouse at Bedford where bulk supplies are received from the manufacturers; the lamps are distributed to twelve depots in different parts of the country. About 60 per cent of sales is made to wholesalers, 20 per cent is made to retailers and 20 per cent to users. Asked about its ability to compete with its parent companies in the main brand market, Cryselco said 'The company has been in business for Cryselco branded lamps for seventy years and has built up goodwill in the trade based on service and quality. A continued necessary requisite for the smaller company is the maintenance of a speedy delivery service and we are equipped in this respect in the operation of twelve adequately stocked depots'. The company said 'We would have thought that it was generally known in the trade that we were no longer manufacturing'.

Philips Electronic and Associated Industries Ltd.

262. *History and organisation.* Philips Electronic and Associated Industries Ltd. (Philips), formed in 1947 as the holding company for the Philips Group in

*But see paragraph 481 chapter 10.

the name of Philips Electrical Industries Ltd., is a wholly owned subsidiary of NV Philips. The change of name took place on 1st June 1964. The three principal wholly owned subsidiaries of Philips in the United Kingdom concerned with reference lamps, and their respective main functions relative to reference lamps, are:

Philips Electrical Ltd.	Manufacture and sale of 'Philips', 'Stella' and 'Corona' brand products.
The Stella Lamp Co. Ltd.	Sale of 'Stella' brand products.
Mullard Ltd.	Manufacture and sale of certain components for reference lamps.

Philips Electrical, originally Philips Lamps Ltd., was formed in 1925 as a wholly owned subsidiary of NV Philips. Stella, originally the Harlesden Lamp Co. Ltd. and historically the oldest company in the group concerned with lamps, was acquired by NV Philips in 1930 (see paragraph 153). Stella is managed by Philips Electrical. Corona, a subsidiary of Philips Electrical, was formed by Philips Electrical in 1961 to compete directly in the cheap lamp sector of the market. It ceased to trade in February 1967 and its name has since been changed. 'Corona' brand lamps are no longer made in any quantity. Mullard is concerned primarily with the manufacture and sale of electronic components; it also makes wire and coiled filaments for lamps which it sells to Philips Electrical and other lamp manufacturers in the group and outside.

263. Philips has a joint interest with GEC in Cryselco (see paragraphs 260–261). NV Philips has joint interests with GEC and Crompton, and in some cases with BLI also, in lamp companies in certain overseas countries (see paragraph 284).

264. Philips has a 51 per cent interest in a public industrial holding company, ADA (Halifax) Ltd. (It originally acquired 75 per cent of the equity by a take-over bid in 1960, but its holding was subsequently reduced as a result of a variety of transactions, including the issue of new shares by ADA for the purpose of acquiring interests in other companies.) ADA owns a number of radio and electrical wholesaling and retailing subsidiaries operating in different parts of the country, including Scotland and N. Ireland; most of them handle reference lamps.

265. Philips, directly or indirectly, has a controlling interest in three other United Kingdom companies concerned with reference lamps. These companies, and their respective principal functions relative to reference lamps, are:

Luxram Lamp Works Ltd. (Luxram Works)	Manufacture of filament lamps.
Luxram Electric Ltd. (Luxram Electric)	Sale of 'Luxram' and 'Corona' brands and customers' own brands, and the manufacture and sale of lamp-making machinery.
The Kingston Lamp Co. Ltd.	Manufacture and sale of 'Kingston' and other brands of filament lamps.

266. Philips told us in July 1966 that in 1960 it began to consider increasing Philips Electrical's production capacity for fluorescent lamps. It said that Philips Electrical had always held an important share of the so-called 'special lamp' market through its access to the 'special lamps' made by its parent company in

Holland in the volume which enabled them to be supplied at economic prices. The size of the demand for these lamps in this country made it uneconomic for Philips Electrical to make them and, as the number of types increased, Philips Electrical's imports from NV Philips continued to grow. Philips had had in mind an arrangement with NV Philips and its continental subsidiaries whereby, in return for the purchase of special lamps from NV Philips, Philips Electrical could increase production capacity for fluorescent lamps and supply NV Philips and its continental subsidiaries with a part of their requirements of fluorescent lamps at economic prices. Such an arrangement, it was thought, apart from balancing Philips Electrical's imports, would have had the industrial advantage of establishing sufficient production of fluorescent lamps at Philips Electrical's factory to enable it to compete more successfully in the United Kingdom market for fluorescent lamps. Philips said that the breakdown in negotiations between the United Kingdom and the Common Market countries seriously restricted the possibility of giving effect to these proposals. Faced with the certainty of reductions in tariff barriers within the Common Market and a relative increase in the tariff barriers between the United Kingdom and the Common Market, Philips Electrical could not expect to supply its continental associates with fluorescent lamps at prices competitive with European cost prices, and increased export possibilities tended to come from the relatively smaller EFTA countries. The merger of the AEI and Thorn lamp and lighting interests in 1964 gave BLI substantial potential production volume for GLS lamps as well as for fluorescent lamps; and furthermore BLI with GEC controlled the sole source of supply in this country of glass bulbs and lamp caps. It became a matter of some urgency for Philips Electrical to 'broaden its production base in fluorescent tubes and filament lamps and also to consider ways of ensuring a supply of basic components at competitive prices'. Philips had embarked in 1963 on tentative discussions with GEC to see if it was possible to agree on a rationalisation of production whereby each company would concentrate on different types of lamps. These negotiations never reached an advanced stage and come to an end in the middle of 1964. Philips said that it was against this background that it began negotiations with Luxram Electric in 1964 and Kingston in 1965. It did not wish to integrate the commercial activities of these companies with its own but any arrangement based solely on rationalisation of production would have left the companies open to take-over approaches by competitors and, in the event, it acquired control of both companies. It acquired a 60 per cent interest in Luxram in July 1965 and subsequently divided the business between two separate companies. It retained its 60 per cent interest in the manufacturing company, Luxram Works, and transferred its 60 per cent interest in the sales company, Luxram Electric, to ADA (Halifax). The remaining 40 per cent interests in both Luxram companies are beneficially owned by the former proprietor (and members of his family), who manages both sides of the business. Luxram Electric has a wholly owned subsidiary, Goodley Electric Jacquard Co. Ltd., engaged in general engineering, including the manufacture of lamp-making machinery. ADA (Halifax) acquired a 60 per cent interest in Kingston in April 1966. The Kingston business is managed by the former proprietor. Kingston has two wholly owned selling subsidiaries for the sale of 'Insular' and 'United' brands of GLS lamps.

267. Philips has told us that, although Luxram and Kingston are treated on the commercial side of their businesses as independent companies with independent sales policies, it is encouraging as much rationalisation of production as possible between Philips Electrical, Luxram Works and Kingston. It is concerned to get

longer runs of ordinary filament lamps at Philips Electrical's Hamilton factory and so reduce its costs, and to create a situation at Luxram' Works factory where shorter runs could probably be made more economically than at Hamilton; and it is also concerned to obtain, through Luxram Electric, an additional outlet for Philips Electrical's fluorescent lamps. Philips said that this policy was working to the considerable benefit of all three companies.

268. *Sales.* For the three years to 1967, total net sales by the group of reference lamps, including imports and lamps purchased from other United Kingdom manufacturers, were:

	1965 (£'000)		1966 (£'000)		1967 (£'000)	
	Filament	Fluorescent and discharge	Filament	Fluorescent and discharge	Filament	Fluorescent and discharge
Philips Electrical	2,023	2,701	2,149	3,080	2,294	3,206
Luxram Electric	450	—	475	—	445	—
Kingston	235	—	283	—	288	—
	2,708	2,701	2,907	3,080	3,027	3,206
Totals	5,409		5,987		6,233	

Imported lamps, mainly discharge and fluorescent, accounted for about 8 per cent by quantity and 30 per cent by value of Philips Electrical's total net sales in 1967.

269. Of the total net sales of Philips Electrical in 1967, excluding sales to Cryselco, the approximate proportions sold to the four main classes of customers were:

	Per cent
To wholesalers	42
To retailers (including electricity boards and multiples)	12
To users (including government departments)	32
To other manufacturers (including Luxram and Kingston)	14

Of Philips Electrical's total net sales for 1967 the main brands, Philips, Stella and Cryselco, accounted for about 86 per cent; sales to Luxram, Kingston and the Controlled Companies accounted for about 5 per cent; and sales to other manufacturers of their brands for about 9 per cent. We deal in the following paragraphs 270–286 with the production and distribution arrangements of Philips Electrical; in paragraphs 287–290 with those of Luxram; and in paragraphs 291–293 with those of Kingston. As we have already indicated both Luxram and Kingston operate only in the cheap lamp sector of the market.

270. *Production.* Philips Electrical operates one lamp factory at Hamilton, Lanarkshire, where a wide range of lamps of each of the descriptions in our reference is produced. Philips Electrical has said that as a basic policy all lamps required for the United Kingdom market are manufactured at Hamilton. 'In the case of special lamps where the United Kingdom requirement is insufficient to justify the necessary capital outlay, we import because we can derive economic advantages. We also import if at the time production facilities are not available.' It also said 'We import a number of lamps for other manufacturers who could not manufacture economically in the quantity required'. It said that it was, for example, the sole supplier of the 180 watt SOX sodium discharge lamps; it imports

these from the parent company as the demand in this country is not sufficient to justify production at Hamilton. The main brands, Philips and Stella, are made to BSI Standards where these exist for the type of lamp, and are subject to BSI licences where such licence arrangements exist for the type of lamp. The bulk of production of GLS lamps of these brands is of the coiled-coil type (about 90 per cent in the case of the Philips brand). Corona lamps, which are all the domestic single-coil GLS type, are made to BSI Standards where these exist for the type of lamp, but are not the subject of a BSI licence nor is any guarantee given. Although all three brands of GLS lamps are made on the same machines, Philips told us that they are made in separate runs for each brand and the production supervisors are aware of the brand being manufactured at any time. The acceptance of materials and components for Corona lamps is said to be less strict than for the main brands; in particular, filaments and caps which would be rejected for runs of Philips and Stella brands are often accepted and used for the Corona brand. Philips told us that because the BSI standard quality control checks, in so far as they relate to safety, are not applied so rigorously to Corona lamps 'it is likely that the quality of Corona lamps will not be as consistent as for the Philips and Stella brands'.

271. Philips Electrical produces two types of mushroom shaped GLS lamps, the ordinary interior white coated type, and its 'Superlux' type in which the crown of the bulb is internally frosted and the rest is internally white coated. The object of the special design of the Superlux lamp, which is otherwise the same as the ordinary mushroom lamp, is said to be to direct some of the light in a preferred direction. In 1967, these two types accounted for 16 per cent (ordinary mushroom) and 10 per cent (Superlux) respectively of Philips Electrical's sales of main-brand GLS lamps in the 40–150-watt range. Philips agreed that the ordinary mushroom lamp gives about 8 per cent less light than the corresponding pear shaped lamp due to the light absorbing interior coating. Philips Electrical says that this light reduction is kept to a minimum because it uses coiled-coil filaments in all its mushroom lamps. It said that the light maintenance throughout the life of the mushroom lamp is less good than that of the pear shaped lamp because of its smaller size which provides a smaller area on which the evaporated tungsten can settle. The layer of blackening on the inside of the bulb therefore thickens more quickly; this applies equally to the Superlux type, although the light maintenance throughout life is one to two per cent better than that of the ordinary mushroom. We asked Philips what was meant by its promotional claim for the Superlux lamp which states 'You get 35 per cent more useful light for your money with Philips' Superlux than with ordinary bulbs'. Philips explained that by 'useful light' it meant light in a 70° cone downwards (when the lamp is in a pendant 'cap-up' position) which is where the light is wanted, and it said that the 'lamp gives 35 per cent more light in that cone than with an ordinary pear shaped lamp'.

272. Philips Electrical does not make a long life GLS lamp. It told us that its policy is 'not to promote long life lamps in preference to the 1,000 hour BSI 161 type' because, for reasons it detailed, 'this would not be economically in the interest of the general user having regard to the overall cost in relation to the performance of the lamp'. Where specialist users specifically ask for long life lamps, e.g. for lamps made to the NCB 241/64 2,000 hour specification, and will offer contracts for reasonable quantities, the company is prepared to quote. Philips said that for manufacture of long life lamps on its high speed units, it would normally require an order involving a minimum run of 25,000 lamps, and that for large production quantities, delivered in large consignments, the costs of

production of the long life lamps 'should not be substantially greater than for normal single-coil lamps'. Philips' further comments on long life lamps are in chapter 11.

273. Philips Electrical told us that over 20 per cent of its total sales of main brands of GLS lamps, including mushroom types, are 250 volt, and that this proportion is fairly consistent for all lamps in the 25- to 100-watt range. Of the total sales of main-brand GLS lamps in the 240- to 250-volt, 25- to 100-watt range, coiled-coil and single-coil, pearl finish, mushroom and Superlux, the proportion of 250-volt lamps is over 26 per cent. Philips has no detailed figures of variations in regional demand, but knows that there is a higher proportion of sales of 250-volt lamps in Scotland and North East England than in the rest of the country. It said 'the public are learning by experience that in order to get the normal 1,000 hours, because of the variations in the supply voltage, they are having to buy 250-volt bulbs'. It does not specifically advise the public of the extra life to be achieved by under-running, but it thinks that many members of the public are aware of it, either because they have been told by an electrical retailer or because the information was published in 1960 by the Consumers' Association in its publication *Which?*.

274. About 90 per cent of the plant and equipment for the manufacture of reference lamps at Hamilton is imported from NV Philips. All the plant and equipment is maintained by Philips Electrical, which is also responsible for the introduction of modifications in design where these offer improved or more economical performance. Glass bulbs are obtained from Glass Bulbs; glass bulbs, tubing and rod from GTC; glass tubes for fluorescent lamps from Chance Bros.; vitrited caps from Lamp Caps; bi-pin caps from Lamp Presscaps; and wire and coiled filaments from Mullard. Components imported from NV Philips include special spirals, electrodes, fluorescent powders, bi-pin caps, glass tubes for discharge lamps and other glass items, and various gases and chemicals.

275. *Distribution.* London Carriers Ltd., a Philips subsidiary, operates three bulk stores at Croydon, Hamilton and Sywell, Northampton, for the distribution of most of the group's products. Philips Electrical also has a bulk store in N. Ireland. The Philips main brand is distributed from all these stores. The Stella main brand is distributed from Croydon. The transport of these brands from the bulk stores to customers' delivery points is undertaken by London Carriers Ltd. and by another Philips subsidiary, Provincial Carriers Ltd. What are, in effect, separate sales forces providing national coverage are maintained for the main brands. Philips Electrical has a regionally based sales force which provides representation in all areas to wholesalers, retailers and users. A technical sales force includes specialists in the different product classes and deals, in particular, with the requirements of local authorities and commercial and industrial users. Stella has a sales force which operates mainly in the Midlands and Southern England and it has appointed agents who cover other areas. Philips told us that the reason for the existence of the two main brands with separate selling organisations is that they 'enable a deeper penetration of the market than is possible with one brand only', and that a separate brand loses much of its effectiveness if it becomes too closely identified in selling and marketing with the selling and marketing of an associated brand. In addition, the brand name Stella has a use in export markets in those cases where Philips cannot use the Philips brand name. Sales of Corona lamps are now handled by Luxram Electric.

276. *Prices.* Philips Electrical told us in November 1966 that its customers were classified for the purpose of arriving at discounts on evidence available to it from two sources. One source was the customers themselves; most were aware of the classifications used by the company and generally speaking the company accepted customers' claims without calling for audited returns. The other source was ELIC, which Philips Electrical said 'provides its members with information as to the categories in which customers should be placed for discount purposes'. Philips supplied us with a copy of the printed list of classified users produced by ELIC in 1963 (see paragraph 178) and said 'this manual is published and distributed to members by ELIC at approximately five year intervals. During the interim period from the publication of one manual to the date of publication of the next, particulars are received by members of ELIC of revisions and amendments arising from time to time'. It said that these arrangements came into being following the formation of ELIC in 1957. The company explained that it in no way considered itself bound to observe ELIC's classifications, but it was its normal practice to inform the association of a change in classification of a customer when this was decided upon and had been implemented. The user list had been made available to Philips Electrical's wholesalers either direct or, at the company's request, by ELIC. The company's classified wholesaler lists were supplied to its Super Wholesaler.

277. Until April 1967 the discounts allowed by Philips Electrical on its main brands to the classes of distributors and users defined in the ELIC 1960 Discount Schedule were substantially the same as those allowed by the other members of ELIC. Philips Electrical has told us, however, that the Schedule, as set out in appendix 8, table 6, indicates a greater degree of uniformity of practice than, in fact, existed in its case. Its standard discounts for wholesalers had varied in some respects from the Schedule as originally drawn up, and it explained that the classifications shown were by no means exhaustive and its standard terms to many other buyers are not shown. Also, additional confidential discounts or rebates were sometimes given by the company for a variety of reasons as a result of negotiations with individual buyers, and these were related to savings in costs of distribution and administration. Special terms were allowed to five of the users to whom BLI and Osram also allowed special terms (see paragraphs 230 and 251); these terms had been notified through ELIC.

278. Following the abandonment of ELIC's application for the exemption of electric lamps under the Resale Prices Act 1964, Philips Electrical told us on 4th April 1967 that the current position was that it would treat existing list prices as recommended prices for all reference lamps except mercury and sodium discharge and certain studio lamps for which net prices would generally apply. It told us in December 1967 that it had never, in fact, in notifications to the trade or otherwise, described its list prices as 'recommended'. New catalogues then being printed expressly indicated that prices were not subject to resale price maintenance. It explained that the price guide published in 1967, which was supplied to wholesalers and stated to be designed to assist them to 'earn the maximum terms on each order', showed the terms Philips Electrical allowed on direct sales to the different classes of customers, and provided the company with a basis for its trading which enabled distributors to know the discounts which the company itself would expect to offer. The company does not, it said, try to influence the discounts which the distributors themselves give.

279. The trading arrangements operated by Philips Electrical between 1st April 1967 and 29th February 1968 for its main brands are also set out in appendix 8,

table 6. The (catalogue) list prices of its main brands remained (and remain) virtually the same, type for type, as those of the list prices of the other principal manufacturers' main brands.

280. *Inter-trading with other manufacturers.* In 1967 Philips Electrical's sales of reference lamps to manufacturers outside the group (excluding sales to Cryselco) bearing those manufacturers' brand names totalled £51,000. In the same year its purchases of reference lamps, bearing the Philips and Stella brand names, from manufacturers outside the group totalled £28,500. Philips said that the bulk of inter-trading between the principal manufacturers is mainly in what it termed 'high technology light sources', in particular, in sodium discharge and to a lesser extent in mercury discharge. Philips Electrical told us that it has supplied certain sodium and mercury lamps to BLI, bearing the Mazda, Atlas and Ekco brand names, on short term contracts not exceeding six months at negotiated prices. It has supplied Osram with sodium and mercury blended lamps, bearing the Osram brand name, on similar short term contracts. It has supplied Crompton with GLS, fluorescent and mercury and sodium lamps on a regular basis. Sales to other manufacturers, apart from the Controlled Companies, are said to be on a casual and irregular basis.

281. As regards the production of a number of different brands, Philips said there were obvious disadvantages, which it described as 'quite minimal', in producing under a variety of brand names in that from time to time production has to be interrupted for probably about five minutes or so to provide a change of brand name. It said that the demand for a variety of brand names had grown in recent years largely because electricity boards had increasingly adopted a policy of selling a whole range of products, including lamps, under their own brand names.

282. We asked Philips whether the inter-trading in discharge lamps between the principal manufacturers affected the level tendering by the manufacturers to local authorities who were the main purchasers of these lamps. Philips replied that 'obviously it must have some influence if one looks particularly at the sodium lamp sector where, by virtue of our greater technical know-how and production capacity, we are suppliers to all the major manufacturers within the industry. Obviously the prices at which we supply to them must influence their quoting ability when dealing with the local authorities. It would be ludicrous for us to undercut them at every conceivable opportunity when we were in fact supplying them with the lamps in the first place.'

283. *Discussions or consultations with other manufacturers relating to prices of reference lamps.* Philips Electrical told us in July 1966 that on occasions it gave prior notification to its competitors of price or discount changes; these were normally the subject of a press announcement and the notification to competitors usually coincided with the issue of that statement or the submission of the relevant advertising copy. On its own initiative, the company had occasionally had informal discussions with other manufacturers, customers or groups of customers in order to assist its commercial management to determine probable market reactions to changes in prices and discounts which it had in mind. Such discussions had from time to time materially assisted the company in determining its commercial policy. The discussions with other manufacturers relative to contemplated changes in prices or discounts were usually of an informal or casual nature between representatives at varying levels. Such meetings were more likely

to be between two representatives than three or four. Generally such topics would only be discussed as and when manufacturers' representatives met together for some other purpose. The discussions normally took place either in a manufacturer's office, or on the telephone or sometimes during informal discussion after the conclusion of meetings, e.g. those held at the ELIC offices to discuss ELIC business. Philips Electrical also referred to conferences organised by ELIC to which were invited representatives from the EWF and NECTA; 'at such meetings discounts and terms of supply have been discussed but not prices'.

284. *Restrictive agreements.* As we have shown, NV Philips is a party with AEI L & L, Osram and Crompton, and in some cases BLI also, to certain agreements relating to overseas companies which have been registered with the Registrar of Restrictive Trading Agreements (see paragraph 217). Philips Electrical has been a party to the arrangements for the supply of lamps to the Controlled Companies by the shareholders.

285. *Patents, research and development.* Philips told us that its experience is that patents, of themselves, are rarely of critical importance in the manufacture of reference lamps but patents in conjunction with know-how relating to manufacturing processes are important. NV Philips has licence exchange agreements and know-how exchange agreements with General Electric, USA, and Osram GmbH, Germany, and an arrangement, limited to patent exchange, with Westinghouse, USA. Philips, through arrangements with NV Philips, thus has access to patents and know-how originating with General Electric and Osram GmbH and to patents originating with Westinghouse. An agreement for the exchange of patents and know-how on lamps, between NV Philips, AEI and GEC terminated in 1964 (see paragraph 212). GEC and NV Philips have recently negotiated a bilateral agreement covering patent and know-how exchange; Philips has no direct technical exchanges with GEC under this agreement.

286. As a matter of historical development, virtually all research and development work associated with reference lamps (though not with other products) undertaken by the Philips organisation is carried out outside the United Kingdom by the parent company and associates. Reference type lamps were the first products of the NV Philips organisation, and research and development centres were well established on the Continent before the setting up of research laboratories by Philips in this country. All the Philips organisation's research and development costs are pooled and are shared on a world-wide basis related broadly to production. The United Kingdom Philips group's contribution for 1967 in respect of lamps to the total research and development costs incurred by the whole organisation was approximately £240,000. Philips said that it was not possible to say precisely what proportion of this contribution related to reference lamps. A substantial part of NV Philips' research in the field of lamps related to mercury vapour and sodium discharge techniques.

287. *Luxram Electric Ltd. and Luxram Lamp Works Ltd.* Luxram Works operates a factory at Rochester where it manufactures single-coil and coiled-coil GLS lamps from 15 to 1,500 watts in a range of voltages and also other lamps which are outside our reference. It holds a BSI licence covering single-coil GLS lamps in the 25- to 500-watt range. Coiled-coil lamps represent less than 5 per cent of the GLS types produced. About 25 per cent of Luxram's total sales of GLS lamps is 250 volts. The bulk of the plant and equipment for the manufacture of lamps is designed and built by Luxram Electric and maintained by the company. Glass

bulbs are obtained under Philips Electrical's contract with Glass Bulbs; other components are purchased independently.

288. Substantial quantities of GLS lamps are purchased by Luxram Electric, mainly from Philips Electrical and Osram, for resale under the Luxram and certain customers' own brand names. Fluorescent lamps are purchased, mainly from Philips Electrical with smaller requirements from other manufacturers, for resale under the Luxram brand name. Sales to other manufacturers are generally of special types of filament lamps. About 62 per cent of Luxram Electric's total sales of reference lamps is of the Luxram brand. This brand is sold to wholesalers, retailers, local authorities, and commercial and industrial users at discounts off list prices which are higher or at net prices which are lower than the corresponding terms allowed by the principal manufacturers on their main brands; the list prices are the same as those of corresponding types of main brands, but only in the case of fluorescent lamps are they recommended. The other 38 per cent of total sales comprises sales under customers' own brands, including sales to electricity boards, chain stores, wholesalers and some retailers. Sales of own brands are made at negotiated prices related to quantities purchased; retail list prices are not recommended and the lamps are retailed at the same prices as those charged by Woolworth for comparable types.

289. Luxram Electric told us that until about two years ago the minimum quantity which it would supply to retailers free of delivery charges was 300 lamps. It said 'This has now gone by the board and we have to supply in any quantity on value per consignment. We still try to get delivery charges paid by the retailers when the value is below £3 0s. 0d. In the case of users, however, we do not enforce this, and this is where services come in. Our sales to industrial and commercial users are of great importance to us because they can pay better prices and they expect better service. This is of importance to them and we do not prescribe for the industrial and commercial user minimum quantities at any time, if needed'.

290. Luxram first introduced a long life lamp before the last war for export to Norway; the lamps were made to a specification of the Norwegian Electricity Commission. The 'Double Life' lamps which Luxram now manufactures are made to the IEC 64 A specification for 2,500-hour lamps, but they are guaranteed for 2,000 hours under normal conditions. Luxram said that the Double Life lamp 'has become now very popular with a certain number of Councils and Corporations, who find the cost of replacement much higher than the small amount of loss of light'. The retail list prices of the Double Life lamps are higher than those of standard GLS lamps; for example, the retail list price (ex p.t.) of the 100-watt Double Life lamp is 2s. 6d. compared with 1s. 6½d. for the 1,000-hour Luxram 100-watt single-coil lamp.

291. *Kingston Lamp Co. Ltd.* Kingston operates a factory at Hull where it manufactures GLS lamps in wattages from 5 to 1,000 in a range of voltages, and various other types of filament lamps including mushroom. Coiled-coil lamps represent about 1 per cent of sales of GLS types. About 7½ per cent of Kingston's total sales are 250 volts. Kingston told us that Philips negotiates contracts for components on behalf of Philips Electrical and its associated companies, and Kingston takes advantage of these contracts where it suits it to do so. It is currently ordering most of its supplies of components on the basis of Philips Electrical's prices; the only items which it is buying independently are glass tubing and rod. Kingston buys plant and equipment for the manufacture of lamps from Luxram Electric and other suppliers.

292. Relatively small quantities of reference lamps are purchased from other manufacturers, mainly from Crompton, for resale under Kingston's own brand names. Sales to other manufacturers, including Crompton, Maxim and the Controlled Companies, are also relatively small. About 80 per cent of sales of Kingston brand lamps is made to wholesalers and the remainder to retailers and users. In common with Luxram, Kingston's discounts to distributors are generally higher than those allowed by the principal manufacturers on their main brands, and the list prices are the same as those of corresponding types of main brands. As a guide in determining its prices to users, Kingston has a scale of quantity discounts ranging from 10 to 45 per cent off list prices for annual purchases of £5 to £1,500. Customers for own brands of lamps include electricity boards and wholesalers who fix their own retail prices, which are generally the same as those charged by Woolworth for comparable types. Kingston also supplies a limited range of GLS lamps to its subsidiary company, The United Electric Co. (Liverpool) which are sold to wholesalers and supermarkets under the brand name 'United', and it also supplies the same limited range of lamps to its other subsidiary, Insular Electric Lamp Works, which are sold to wholesalers under the brand name 'Insular'; the list prices of United lamps are recommended and are generally the same as Woolworth's.

293. Kingston told us that before 1966 it was making small quantities of 2,500 hour lamps to the IEC 64 A specification for sale, on request, to a few larger users including, at one time, Manchester Corporation. In 1966, Kingston's tender to BR for long life GLS lamps made to the NCB 241/64 2,000 hour specification was accepted for the supply of the lamps to one of the Board's regions (see paragraph 443); Kingston started to supply the lamps in September 1966 and continues to do so. The lamps are made on the company's existing machines and Kingston has told us that it has found no particular difficulties in manufacture. The average cost of production is said to be about 5 per cent higher than the average cost of production of standard 1,000-hour lamps. Insular Electric Lamp Works also tendered to BR for lamps to the NCB specification at prices which were higher than those of Kingston. Kingston explained that the subsidiary is a separate company, selling its own brand of lamps and putting in its own tenders, and that 'because the volume of sales of Insular lamps is less than the volume of Kingston lamps, certain raw materials are not available at such advantageous terms as for Kingston lamps and the Insular company is not able to quote quite so keenly'.

Crompton Parkinson Ltd.

294. *History and organisation.* The Crompton business was started in 1878, and the present name was adopted in 1927 when F. & A. Parkinson Ltd. and Crompton and Co. Ltd. were amalgamated. The company entered the lamp industry in 1930 and by 1935 it was one of the more important independent manufacturers outside ELMA. In 1937 it became a member of ELMA and a party to the Phoebus Agreement as part of the settlement of actions for patent infringement brought against it by the principal members of ELMA. It was one of the founder members of ELIC. Crompton has interests, with other leading lamp manufacturers, in certain overseas lamp companies (see paragraph 217). It has also been party to the arrangements for the supply of lamps to the Controlled Companies by the shareholders. In February 1967 Crompton was acquired, for cash, by Hawker Siddeley Ltd.

295. *Production.* Until 31st December 1967 lamps were manufactured by Crompton's wholly owned subsidiary, F. & A. Parkinson Ltd., at its factory at Guiseley, Leeds, and were marketed by that company and by Crompton. The undertaking of F. & A. Parkinson was then transferred to Crompton which has since been responsible for both manufacture and selling. Crompton makes a range of GLS and other filament lamps and two types of fluorescent lamps and one type of mercury discharge lamp. Almost all the GLS lamps are the single-coil type; these have a special shatter-proof fuse which is patented by Crompton. Until 1959 lamps were sold under the main brand name 'Crompton' and a cheap lamp was sold under the brand name 'Kye' (see paragraph 162); the Kye brand was then discontinued and a second brand 'Hygrade' was introduced for supply to the cheap lamp sector of the market, mainly to supermarkets and chain stores. This was followed by the supply of own brand lamps to two multiple retailers.

296. As already mentioned in paragraph 203, in 1960 Crompton developed, at the request of the NCB, a long life lamp to be used principally in conditions where replacement was difficult and expensive. The NCB stressed that there should be no discernible drop in light output below that of the standard 1,000-hour lamp. The early development work centred on a single-coil lamp with an average life of 1,500 hours. Subsequent developments resulted in the NCB 241/64 specification for single-coil lamps with average lives of 2,000 hours in the 230–250 voltage range and 3,000 hours in the lower voltages, and with a light output which is about 7½ per cent below that of standard 1,000-hour lamps. Crompton said that, when the Council of ELIC considered and agreed a specification which conformed to the IEC 64A specification for a 2,500-hour lamp (see paragraph 178), Crompton continued with the 2,000-hour lamp because it believed that to be the right optimum for a long life lamp. Crompton has told us that the only difference in construction between the NCB long life lamp and the standard 1,000-hour single-coil lamp is in the special filaments used for the long life lamps which are a little more costly than ordinary single-coil filaments as they contain more metal. The long life lamps are made on Crompton's standard machines; and the specification requires extremely tight tolerances. This applies particularly to the manufacture of the filament, but it also applies to the otherwise standard production of the lamp in that an additional inspection is required to ensure that the light output is right for the wattage concerned. Crompton told us that the wattages of the long life lamps are, in fact, precisely as rated. It also told us that the light maintenance throughout life tends to drop over 2,000 hours by about the same amount as the light maintenance throughout the life of the standard single-coil lamp drops over 1,000 hours; the darkening process in the case of the long life lamp is slower because of the lower temperature of the filament.

297. Crompton started to supply long life lamps to the NCB in 1961, and in August 1962 it started to supply the lamps to other buyers. 'We introduced it on the market, starting with the individual users where it was likely to be of value. We did not think it would be of value in the domestic market. The amount of sales effort put behind it and the necessity of maintaining double stock was such that we withdrew it.' We understand that this sales effort continued for about a year. The list price of the lamp was 1s. 11d. compared with 1s. 6½d. for the standard 1,000-hour lamp. Crompton told us that the lamp was not advertised otherwise than by its salesmen calling on users, and by the distribution to wholesalers of a leaflet which included the following description:

'DOUBLE LIFE-LIGHT

to save you time and money

'Double Life-Light' have been developed specifically to reduce the Labour Costs involved in the task of Lamp replacements

The normal general service tungsten lamp, made to British Standard Specifications, is designed to give maximum lumens consistent with a rated life of 1,000 hours—an optimum value designed to meet the majority of applications in commerce and the home where the balance between light output and the cost of current is the one important factor. In so many sections of industry today there is another and extremely important factor which is of serious economic concern—a factor which must be considered when calculating overall costs. This is the high cost of labour involved in changing the lamp and the frequency with which this occurs. Crompton 'Double Life-Light' will reduce these costs—they will halve them. Carefully designed with a sturdy construction, *they have a rated life of* 2,000 *hours* twice the life of normal lamps but with only a small reduction in the output of light. This is termed 'Industrial Rated Light Output', as printed on the cartons. The development of 'Double Life-Light' follows considerable study of the problems and of modern industrial needs. The lamps have successfully undergone extensive field trials and already many hundreds of thousands have been supplied to a large and extremely important national concern. Crompton 'Double Life-Light' lamps are intended for use:

1. When labour costs involved in changing a lamp are high.
2. Where access for replacement is difficult.
3. Wherever long reliable life is more important than just that little extra output of light.'

298. In 1967, as a result of an invitation by BR to it and to other manufacturers to tender for the NCB long life lamps, Crompton started to supply the lamps to certain sections of BR. It continues to supply three commercial and industrial users who first purchased the lamps in 1962. The evidence of the NCB and BR about their purchases and use of the lamps is in chapter 9.

299. Crompton said that there was no intention of selling the long life lamps to the general public. 'We believed and we still believe that its application, its only application, is in those cases where a user primarily is involved with high maintenance costs.' It considers that to sell the lamp to the general public would not be selling it the best proposition; 'the optimum is 1,000 hours as near as we can get'. 'With the cost of current going up, as it has done, and lamps even coming down or remaining stationary, probably the optimum would be a little lower.' Crompton suggested that if the optimum was lowered, the result would be to its advantage in that it would in fact sell more lamps; 'but a major standard only comes into being once in many years. You do not lightly disturb the standard'.

300. *Distribution.* Crompton has a sales control office at Northampton, 26 wholesale depots and an agent in N. Ireland. Deliveries to government departments, and to nationalised industries, such as the NCB and BR, are generally made direct from the factory. Supplies to chains and supermarkets are generally delivered to these customers' wholesale depots but in some cases, including a chain with 200 branches, supplies are delivered to the individual shops. Crompton recognises three Super Wholesalers who sell to other wholesalers, Stearn Electric, Z Electric and Foster.

301. *Sales.* For the three years to 1967, Crompton's total net sales of reference lamps of its own production were:

	1965	1966	1967
	(£'000)	(£'000)	(£'000)
Filament	897	1,044	1,096
Fluorescent and discharge	437	573	601
Total	1,334	1,617	1,697

In 1967, the approximate proportions of the total sold to the four main classes of buyers were:

	Per cent
To wholesalers	45
To retailers (including electricity boards and other multiple retailers)	16
To users (including government departments)	18
To other manufacturers	21

Sales of the main brand accounted for 81 per cent of the total of filament lamps sold in 1967; sales of the second brand Hygrade for about 14 per cent; and sales of own brands, including sales to other manufacturers, for about 5 per cent.

302. *Prices.* Until 1st April 1967 the discounts allowed on the main brand were generally the same as those allowed by the other members of ELIC. As regards discounts to users, Crompton told us in November 1966 that

> for many years past the Electric Lamp Manufacturers' Association maintained accurate records of user customers' total purchases, compiled from information supplied by its individual members and the distributive trade. Following the dissolution of ELMA and the formation of the Electric Lamp Industry Council these records were available and adjusted to take into account the business secured by Atlas and Ekco, from this a User Discount Schedule was produced with three classifications:
>
> A. Recognised Users with purchasing potential under £1,000 annually.
> B. Users with purchasing potential between £1,000 and £10,000 annually.
> C. Users with a purchasing potential over £10,000 annually.
>
> This schedule formed part of the trading structure registered by the ELIC in 1957. In December 1960, the registration was abandoned, but we have since continued to operate the schedule. This schedule is continuously the subject of adjustment. Customers being aware of the system we operate may point out that their purchases exceed the turnover associated with their particular discount; in such cases we call for some evidence in writing concerning their total purchases which may include supplies from other Electric Lamp Industry Council members, non-members and distributors. It is correct that discounts to users are related to their total purchasing potential and not connected with the amount of business we may be receiving at any particular time. In this respect we follow a long established practice in the industry as a convenient and acceptable means of trading. The majority of large buyers much prefer to place their business with more than one manufacturer, in order that they may have a wider choice between types and because there is no one manufacturer that makes every type of lamp. Whilst the business we could be receiving from a particular large user may appear to be small relative to the discount we extend, we take into account the fact that the large potential buyer usually orders in bigger consignments which reduce handling charges. Further it would be difficult to operate any other system, having regard to the pattern of competition.

Crompton said that the book of listed users compiled by ELIC in 1963 was issued to its depots; these were kept approximately up to date by the issue of amendments by Crompton's sales control office. Crompton also told us that the origin of its list of large retailers and contractors was substantially the same as the origin of the user list. Special rebates were allowed to fourteen large wholesalers, and special terms to seven large users who were amongst those to whom BLI and the other members of ELIC Ltd. were allowing similar terms. Crompton said that for these users it was 'more a matter of offering the discount to meet the known competition without necessarily securing any worthwhile business'.

303. Subject to three exceptions the recommended retail list prices of the main brand are the same, type for type, as those of the other principal manufacturers' main brands. Crompton told us that its prices for three types of lamps differ from the prices of other ELIC members. 'Our price for the coiled-coil lamp is dearer and our price for Newshape (the mushroom type) and Fireflame are

cheaper than the corresponding prices of other ELIC members.* The first two types of lamp constitute a substantial part of the total tungsten market and a major part of the domestic market.' (In Crompton's case, production of coiled-coil GLS lamps represents less than one per cent of its total production of filament lamps.) The Hygrade brand and customers' own brands are sold to the cheap lamp sector of the market at negotiated prices related to quantities.

304. *Inter-trading with other manufacturers.* Crompton said that it has supplied lamps at different times to all the other United Kingdom manufacturers. There are no common arrangements as regards prices and as the lamps are normally supplied either in the interests of rationalisation or for making use of spare production capacity, the terms are normally better than those allowed to other customers. In the twelve months to June 1966 Crompton's sales of reference lamps to other manufacturers under their brand names totalled £116,017 of which £109,185 related to filament lamps. In the same period its purchases of reference lamps bearing the Crompton brand name totalled £356,411, mainly fluorescent and discharge. Commenting on the difference between these sales and purchases, Crompton said 'We manufacture broadly all the GLS range from 15 to 1,500 watts and two tubes, i.e. the 4-ft tube size and the 5-ft tube length. We manufacture only one particular type of discharge lamp known as the MA lamp. All the rest of the lamps which we market are bought. This means that we are bringing in practically all the discharge lamps that we sell, quite substantial quantities of the fluorescent tubes we sell, and also some of the special tungsten lamps such as the candle and strip light. Those by and large are very expensive compared with the standard tungsten lamp. Thus our purchases tend to be fairly high in value . . . I should think in terms of quantity we sell more than we buy'.

305. *Discussions or consultations with other manufacturers relating to prices.* Crompton told us in August 1966 that it had no arrangements for such discussions 'but the company trades with other manufacturers and from time to time discussions have taken place about terms and prices. We are advised in retrospect either directly or through ELIC Ltd. of any changes in the terms and prices which have been made by our competitors and similarly keep our competitors informed, but our terms and prices are determined by our own commercial interests'. Crompton subsequently told us that it did not, in fact, advise ELIC of changes in its list prices, but that from time to time it forwarded to the association its price lists and catalogues for reference purposes.

306. *Patents, research and development.* Crompton says that it does not receive any direct benefit from research outside its own organisation. It has a development and research department concerned with lamps, whose work falls into three broad categories—research, including the development of new fluorescent powders—new developments, including the development of special long life lamps and the cathode construction of fluorescent lamps—and testing, including tests of humidity and of the effects of shock and vibration. Crompton says that while know-how is of major importance in all its operations, it has certain patents, two of which are of particular importance; one which it values very highly relates to the special shatter-proof fuse for filament lamps which only Crompton makes.

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*The list price (excluding purchase tax) of the Crompton coiled-coil lamp, 40, 60 and 100 watts, is 1s. 7½d. compared with 1s. 6½d. for other main brands. The list price of the Crompton New-shape mushroom 100-watt lamp is 1s. 10d. compared with 2s. 1½d. for other main brands. The list price of the Crompton Fireflame coloured 60-watt lamp for electric fires is 3s. 0d. compared with 3s. 9d. for other main brands.

British Electric Lamps Ltd. (BELL)

307. BELL, a small private company formed in 1920, was a member of ELMA and is a member of ELIC. It operates a factory at Wimbledon where it makes some 30 different types of decorative filament lamps. A small factory in Dorset makes filaments, almost entirely for the company's own lamp production. All the lamps are made to give a minimum life of 1,000 hours. One type, the vacuum strip lamp, is made to the relevant BS standard; there are no BS standards for the other types produced. BELL told us that although competition in decorative lamps had increased in recent years and the majority of the types it produced were also made by other manufacturers, its specialisation enabled it to compete; and that despite increased costs its price had remained stable over the past six or seven years. BELL said that it would not contemplate entering the GLS lamp market because the high speed machinery required would involve expenditure beyond the resources of small independent companies. About 60 per cent of sales is made to wholesalers, about 30 per cent to other manufacturers under their brand names, including BLI, Osram, Philips, Cryselco and Maxim, and about 10 per cent direct to retailers and users. BELL told us that, although its total sales had increased in recent years, its sales to other manufacturers had decreased. Purchases from other manufacturers of lamps bearing the BELL brand name represent only a small proportion of total sales and are usually of types where the demand does not justify production by BELL. BELL's retail list prices are recommended and are generally the same, type for type, as those of the principal manufacturers' main brands. BELL used the ELIC 1960 Discount Schedule as a basis for its trading, but varied the terms according to the circumstances of its specialised trade. BELL told us that it considered that ELIC was of great value to the industry generally, particularly in the field of standardisation. It said that the benefits to it of membership of the association included the exchange of technical information.

Changes in the trading arrangements of the members of ELIC since 1st April 1967

308. On 9th February 1967, that is, before the ending of resale price maintenance on lamps, representatives of ELIC attended a hearing to discuss with us certain matters relating to the activities of the association and to the operation of the 1960 Discount Schedule which they were at that time following, individually.

309. The association said that, when ELIC was formed in 1957, it thought it had a reasonable compromise in the Recommended Non-Mandatory Discount Structure. 'We always searched very hard, but to find something reconciling the views of the manufacturers and all sections of the distributing trades is most difficult.' As regards the 1960 Discount Schedule, it said that it would be virtually impossible to find any structure which suited everybody: 'from time to time the wholesalers indicate that they do not like it, equally, we find as individuals there are certain features we are not very keen on; but of course one great thing about an established discount structure is that it works. You have experience of using it over a number of years, and an imperfect structure which works is probably preferable to starting again and setting a new one and all the teething troubles involved'. The association suggested that the complexity of the Discount Schedule was inherent in the nature of the product in that the more standard the product the greater the complexities which ultimately arise, mainly because of the importance of service. 'When you are selling products which are similar in

appearance and usage to your competitors', one of the prime promotions in the sale of that product must inevitably be whether you can deliver a product a little quicker than your competitors. This has inhibited the lamp business for a great many years.' Very wide distribution of lamps was necessary if people were to be able to buy them easily. First of all there had to be the maximum number of retail outlets, and also the proper wholesale coverage which meant that almost all wholesalers handled several brands. The members liked this system because it gave immediate availability. But this sort of very wide distribution meant that discounts had to be based on total purchases of all brands from all sources, whereas with a more limited distribution it would be simpler to have, say, basic terms with quantity discounts. One member said he thought that all the members would like a quantity discount system which worked. A quantity discount system had been operated for users under the 1957 Non-Mandatory Discount Structure but had tended to be abused and it had broken down when members had tried to enforce it; distributors had been reluctant to deal with the quantities involved and had tended to supply at quantity terms without delivering in the specified quantities, and users had tended to demand quantity terms on all purchases. 'People will switch from one brand to another at a moment's notice with no difficulty. A wholesaler will stock many brands anyhow and this is an atmosphere in which I think it is not easy to enforce quantity discounts.'

310. The pattern of distribution had not changed very much over the years. The members felt that it was a good pattern; they admitted that it was 'somewhat expensive' but they recognised the basic need to make lamps easily available to the domestic consumer. The pattern had changed a little in that most members were reducing the number of their depots for economic reasons and were tending to increase the volume of their sales to wholesalers instead of acting as wholesalers themselves. Another development was the extent to which the lamp business was moving out the the electrical retail trade into the grocery trade, partly because of the preoccupation of electrical retailers with high priced goods such as refrigerators and television sets. Discounts on lamps tended to be quite attractive to grocers, but sales through these outlets had not reached the proportions they had in the USA where they accounted for the bulk of sales of filament lamps. Lamps were not, however, particularly fast moving goods, and the annual turnover in lamps of the bulk of retailers would be less than £100; the problem was to keep the interest of the retailers and encourage them to stock a proper range, and any reduction in trade discount would obviously lessen their interest.

311. On the matter of list prices and the absence of price-cutting, the association said that resale price maintenance on lamps did not interest people greatly. It was estimated that the average household bought nine lamps a year; 'they do not remember the prices. I do not think they are nearly so concerned with prices of lamps as with packets of cornflakes'. Seeing that the members' list prices of main brands of lamps were virtually the same and they were, individually, following the same Discount Schedule, we asked the association whether there were any sections of the home market where price competition between the members was particularly strong. The association indicated that price competition existed principally in the field of government contracts: competition in other sections was in quality, service, merchandising and marketing. 'This is not a business where we can sit down happy in the belief that if we offer extra discount somebody else will not match it. We have to sell on other things than price and discount, because of our product similarity.'

312. On 22nd March 1967 the Director of ELIC supplied us with a copy of a press notice, issued to the electrical trade press for release on 23rd March, which stated that 'having carefully considered the subject of successfully justifying the retention of rpm on electric lamps, ELIC has reluctantly come to the conclusion that there are no reasonable prospects of doing so. The Council has therefore decided not to offer any further defence of the Statement of Case already delivered and has notified the Registrar of Restrictive Trading Agreements accordingly'. The Director said that he anticipated that the individual members would abandon resale price maintenance at the beginning of April 1967.

313. On 29th March 1967 BLI informed us that it would be abandoning resale price maintenance on lamps on 1st April 1967 and was proposing to alter its discounts on its main brands on the same date. It supplied details of the changes, and made the following points:

(a) in practically every case, the terms to retailers were being slightly increased so that, even without taking into account the existing quantity terms, the buyer would pay rather less;
(b) in addition to the existing terms, some large wholesalers were already receiving an extra five per cent from one or other of the BLI main brand companies and the proposed new basic discounts, in effect, made these terms available to all wholesalers of comparable size;
(c) a quantity discount of 2½ per cent to wholesalers was being introduced with the specific object of encouraging these buyers to place fewer orders for larger quantities, in the interests of economic distribution;
(d) overall, the company did not expect to receive a greater revenue on sales of main brands, but it did hope to achieve a reduction in the cost of distribution.

BLI said that it had asked the Ministry of Technology whether it was necessary to notify the proposed changes under the Early Warning System. The Ministry's reply had indicated that these 'eminently sensible proposals' could not be regarded as conflicting with current prices policy and there was no objection to their being implemented.

314. As we have already outlined in paragraph 196 the changes simplified the basic discount structure for wholesalers and offered them an additional quantity discount for single orders of not less than £75; the classification of retailers and contractors by total lamp purchases was given up and discounts were on a scale related to the value of single orders; one rate of discount was applied to all local authorities irrespective of size or type; and the discount structure for electricity boards was simplified. Discounts and the classifications of gas boards, hospitals and commercial and industrial users were unchanged. Full details of the resulting structure, which includes certain minor additional changes made by BLI in August 1967, are shown in appendix 8, table 6, with, for comparison, the 1960 Discount Schedule.

315. On 6th April 1967 BLI attended a hearing at which, amongst other matters, the changes made on 1st April were discussed. BLI told us that it intended to recommend the resale prices of its main brands; all its literature would appear with recommended prices which would be the same as the previously maintained list prices. One of its objects in considering changes in discounts had been to try and eliminate lists of buyers. It had succeeded in cutting out the lists of retailers as these were no longer classified by total annual purchases. It had not, however,

found it practicable to cut out the user lists, but these would tend to lose their significance as the bulk of the business would be handled by wholesalers over whose selling prices BLI now had no control. BLI explained that the increase in its terms to wholesalers was only nominal as the new terms reconciled a number of special arrangements which had grown up over the years; the increase also provided special quantity terms for the three 'Super Wholesalers', Stearn, Z Electric and Foster, to encourage their sales to other wholesalers. BLI said that quantity discounts had not been introduced for local authorities as those provided in the 1957 Discount Structure had proved to be extremely unpopular and difficult to implement. BLI itself was in favour of quantity discounts, but it was in competition with its wholesalers in tendering for local authority business and for it to try to enforce quantity discounts when the wholesalers would have no such intention would, from past experience, be a waste of time. BLI would continue to base its basic discounts for classified user buyers on purchases of all brands from all sources; it thought this desirable. But if the quantity discounts worked, it would be encouraged to extend them; people were now more inclined to think in terms of quantity discounts than in 1957 when they did not work, and BLI wanted to try them again now.

316. BLI told us that it was hoping that its competitors would follow the changes it was introducing. 'We have all been operating on roughly the same terms, apart from special arrangements. The new terms represent slight increases so no-one would buy from our competitors strictly on the old terms. Therefore they have to alter.' It added that the indications were that some were following its lead.

317. Subsequent inquiries established that the other members of ELIC had abandoned resale price maintenance and were recommending or publishing the list prices of their respective main brands, and, within a short time, had adopted the changes in discounts introduced by BLI.

318. On 7th December 1967 we discussed with Philips a number of matters including the extent of competition in the industry. Philips told us that it had been faced with changing circumstances over the last few months; in fact discounts to the larger wholesalers had escalated over the last month or two to as much as 60 per cent off list prices. Philips Electrical had been the first to offer certain seasonal sales promotion incentives which it had publicised, and others had retaliated; it said that the fact that the escalation in terms to distributors had 'now gone from the sublime to the ridiculous' was not, however, attributable to Philips. Philips Electrical's sales promotion scheme, which operated from 30th October 1967 to 24th February 1968, was a gift scheme for wholesalers' salesmen of a type it had operated in a limited geographical area in 1966. The salesman recorded his sales of Philips lamps each week on special cards and could obtain free gifts, which included linen, china, photographic equipment, sports gear, power tools, travel goods and toys, on a points system.

319. Osram told us on 25th January 1968 that there had been an increase in competition in 1967, not necessarily a big increase, but an increase which had taken the form of competition in discounts to selected customers. This competition had arisen primarily because Osram had introduced in September 1967 a special sales promotion scheme aimed at persuading more domestic consumers to buy Osram lamps. At the same time it had offered incentives, not extra discounts, to distributors to stock the lamps as it felt that it was no good persuading the public to buy more if they were not able to obtain what they required from their

retailers. Osram said that the promotion had been successful and that in order to counter it some of its competitors had offered extra discounts to distributors. Competition had also increased at the wholesale level, due in part to amalgamations and regroupings of wholesalers which had taken place and which had altered the balance in the wholesale trade. In September 1967 Osram introduced a special lamp promotion scheme aimed at selling more Osram lamps to domestic consumers. Purchasers of a pack of three Osram coiled-coil GLS lamps received a voucher which could be used to obtain one of three framed colour prints on a payment of 45s. These prints were currently on sale at approximately three guineas. At the same time incentives were offered to distributors to increase their stocks of Osram lamps and both retailers and wholesale distributors could obtain prizes according to the size of the order placed or the value of the business transacted over a period. This promotion ran from September 1967 to December 1967 and on January 1st 1968 a second scheme was launched. This continued to offer the colour prints to the public and enabled retailers to obtain vouchers against orders placed for Osram which could be set against the cost of holidays in Europe or gifts. The top fifty wholesalers exceeding their target budget of Osram purchases at the end of the three months' period, i.e. January to March 1968, were invited, with their wives, to an evening entertainment and could participate in each region in a lottery which provided two wholesalers and their wives with a fifteen day air travel holiday in the Bahamas. There were also available a few 'surprise gifts of a very elegant nature'.

320. BLI told us in November 1967 that it had decided to introduce additional discounts to wholesalers, retailers and contractors on purchases of all types of GLS lamps. Its circular letter to distributors said 'we have decided, as from now, that we shall dispense with all trade gift schemes and gimmicks, and for a limited period, we shall give you a straightforward "seasonal bonus".' BLI told us on 4th January 1968 that it had had to do this, as some wholesalers had pressed its competitors for extra discounts instead of free gifts and the competitors had given way. BLI was not in favour of gift schemes; whenever they cropped up it temporarily gave a little more discount. However, to meet the competition of a further scheme introduced by a competitor it had decided to give 'free parcels' of main-brand lamps to retailers in the three months to March 1968; the list values of the free parcels (including purchase tax) which consisted of popular types of GLS lamps, were 30s. 4d. on a £25 order; 102s. 9d. on a £75 order and 183s. 1d. on a £125 order.

321. Crompton operated a seasonal sales promotion scheme from 18th September to 18th December 1967 which offered retailers additional discounts for quantity orders. An amended scheme which was operated from 16th January 1968 allowed wholesalers additional discounts to enable them to give the special discounts to retailers and have a small additional discount for themselves. Crompton said that users, domestic users in particular, 'were likely to benefit as a result of retailers being in a better position to sell at a lower price. There is no evidence to prove that this happened'. It said that its autumn scheme was introduced to match the special offers made by Osram. It had not generally operated promotional schemes of this kind but two or three years ago it had a scheme in the form of a competition with prizes of £100 for retailers and a final prize of £1,500 or a Jaguar car; the scheme was not particularly successful.

322. On 1st March 1968 Philips introduced a new discount structure which covered all types of its main-brand lamps. In a letter dated 27th March 1968

Philips reminded us that it had told us in November 1967 that the industry was in a 'state of rapid change' and that the company was moving away from a position in which discounts were related as in the past to a customer's total lamp purchasing potential. It said that this system still had some significance in the case of the larger buyers, particularly wholesalers, but the new structure endeavoured to relate discounts more to purchases from the company and to encourage bulk buying by offering discount incentives associated with consignment values. The new discounts applied to all types of reference lamps including sodium and mercury discharge lamps to which discount terms had previously applied, and the catalogue prices of these types were revised to take account of the higher rates of discounts which now applied to them. Philips said that, except for wholesalers, it no longer kept lists of customers for standard discount purposes; for wholesalers, it applied the alternative qualifications of total lamp purchases from all sources and total purchases from Philips. Retailers, contractors, local authorities and nationalised industries were in a single class; the basic discount was 30 per cent with a scale of higher rates related to individual consignment values. Commercial and industrial users were also now in a single class without any grading by total lamp purchases; no discount was allowed on individual orders of less than £50 and discounts on orders over £50 were on a scale ranging from 30 to 44 per cent, according to value of order. Philips said that, in general, customers making small casual purchases direct from Philips would be required to pay a little more than before but by planning their orders they could buy more cheaply than before. It said that the new structure would simplify its invoicing arrangements and enable it to make other economies in costs of administration and distribution. It would continue its practice of negotiating special and confidential terms where these were warranted by the volume of business. The discount structure adopted by Philips on 1st March 1968 is in appendix 8, table 6. None of the other members of ELIC received any prior notification of the new structure; BLI and Osram told us that they had learnt of the changes very promptly from trade sources.

323. On 1st March BLI wrote to all its wholesalers referring to the recent changes in discounts in the industry; it said, inter alia, that in order to perform his proper function the wholesaler must be provided with reasonable operating margins and BLI's aim would be to preserve these if any revised discounts became necessary. BLI told us that it has not altered its basic trading structure as published but, because in its opinion these terms are no longer competitive with those offered by other manufacturers, it has empowered its local sales managers to adjust the grading of wholesalers and also to grant additional quantity discounts to any customers, both as may be necessary in the light of local competition. It also said that, in addition, it now negotiates centrally with a number of the larger wholesalers and other customers such special terms as may be necessary to compete with other manufacturers.

324. Osram told us on 8th April 1968 that it had made no fundamental changes in its discount arrangements for its main brands, apart from applying the existing discounts for filament and fluorescent lamps to sodium and mercury discharge lamps, with consequent changes in the list prices of these types. It had, however, introduced certain special discount arrangements for large wholesalers based on their total annual purchases of Osram lamps. Osram later informed us that with effect from 25th April it was adding two further steps to the quantity discounts available to wholesalers; in addition to the extra 2½ per cent on a £75 order

it was allowing an extra 5 per cent on a £200 order and an extra 6 per cent on a £400 order.

325. Crompton told us on 10th May that it was meeting the competition from other manufacturers by allowing increased discounts to selected wholesalers based on total business with Crompton; its trading arrangements were otherwise unchanged apart from bringing sodium and mercury discharge lamps into the structure for filament and fluorescent lamps.

II. Other Suppliers

326. The nine small manufacturers of reference lamps, including BELL, accounted for about 7½ per cent of total sales of reference lamps in the home market in 1967. The Controlled Companies group (counted as one manufacturer in this context) which supplied over half this percentage, is dealt with in chapter 6. BELL has already been dealt with, as a member of ELIC, in the preceding section of this chapter. Brief details of the other seven manufacturers follow.

327. *British Luma Co-operative Electric Lamp Society Ltd.**

British Luma is owned in equal proportions by the Co-operative Wholesale Society (CWS), the Scottish Co-operative Wholesale Society (SCWS) and the Ko-operativa Forbundet, Sweden. The company entered into a patent licence agreement with ELMA members in 1937 (see paragraph 158) and started commercial production of lamps in 1939. The agreement, which was expressed to terminate in 1947, was maintained by exchanges of letters until 1951. Until 1961 British Luma made GLS lamps and fluorescent lamps at its factory in Glasgow. In that year, following a reorganisation within the Society, manufacture of fluorescent lamps and filaments for GLS lamps was given up. British Luma makes a range of single-coil and coiled-coil GLS lamps up to 500 watts for sale under its brand name 'UC'; it holds a BSI licence covering these lamps. Fluorescent lamps bearing the brand name are obtained from AEI L & L which holds a special stock of the lamps for British Luma at a depot in Lancashire. Various types of decorative and special filament lamps are obtained from AEI L & L and other manufacturers. Lamps purchased for resale account for about 5 per cent of total sales by number or 28 per cent by value.

328. British Luma has told us that its sales of GLS lamps in Scotland are 'almost entirely 250 volts although the grid is 240 volts. Customers have steadily resisted any attempts to use 240-volt lamps and it may be that they realise that they will get a better life from the lamps as long as the voltage is a true 240 volts'. British Luma said that the only other area for which it has a demand for 250-volt lamps is Newcastle and surrounding districts. British Luma is not at present making a long life GLS lamp; some years ago it made such lamps for a special order from Birkenhead Corporation which had asked for a lamp guaranteed for 2,000 hours.

329. The great bulk of sales is made to the CWS and the SCWS, who in turn distribute the lamps from their various depots to retail co-operative societies. Other customers, including a few local authorities and commercial and industrial users, are supplied direct from the factory. Retail list prices are recommended

**Note by the Board of Trade.* Subsequent to signature of the report BLI acquired the assets of British Luma. Under the terms of a special arrangement with the shareholders of British Luma, BLI will supply lamps for distribution to the retail societies.

by the CWS and the SCWS and are the same type for type, as those of the principal manufacturers' main brands. The CWS and the SCWS are allowed a discount of 44 per cent off list on filament lamps and 48 per cent off list on fluorescent lamps. The CWS and the SCWS sell to the retail co-operative societies on a scale of discounts off list prices related to the number of cartons purchased, each containing twenty-five lamps; the discounts range from 32·5 per cent for one to nine cartons to 36·5 per cent for 200 and over.

330. *Endura Lamps Ltd.* a subsidiary of Keyser Ullmann Industries Ltd., which is in turn a subsidiary of Keyser Ullmann Ltd., merchant bankers, was until November 1966 a supplier of GLS lamps which it obtained from Kingston, the Controlled Companies and Crompton, and of fluorescent lamps which it obtained from Viking Lamps Ltd. In November 1966 Endura acquired Viking, a small company formed in 1950 to manufacture fluorescent lamps, and also its associated company, Fluorescent Starters Ltd., which sold the lamps mainly to other manufacturers under their brand names. The retail list prices were said to be about 40 per cent below those of the principal manufacturers for corresponding types and Viking said that its terms to wholesalers and retailers had been fixed to give it and the distributors 'a reasonable profit margin of 15 to 20 per cent'. Endura has since increased the production capacity for fluorescent lamps at a new factory at Shipley, Yorkshire. It says that a 'sizeable proportion' of these lamps is supplied to four national manufacturers and meets the rigid specifications required by them. Endura has said that its policy, as an independent manufacturer, is to co-operate with competitor manufacturers in technical developments where certain manufacturers co-operate in turn with Endura; and it considers that this type of co-operation is in the public interest. Endura continues to obtain GLS lamps from other manufacturers; the retail prices it suggests in its promotional leaflets supplied to retailers are slightly lower than the normal prices charged by Woolworth for corresponding types and are approximately the same as Woolworth's sale prices.

331. *J. F. Poynter Ltd. trading as Maxim Lamp Works (Maxim)*

The first Maxim lamp was marketed in 1878. J. F. Poynter Ltd., a small private company formed in 1938, has a factory at Hurstpierpoint, Sussex, where it manufactures a simplified range of single-coil GLS lamps and 'Long Life' filament lamps with a guaranteed life of 2,500 hours. The latter are made to Maxim's own specification and the wattages are said to be slightly higher than the declared ratings in order to give a light output approximately equal to that of standard 1,000-hour lamps. For example, a 60-watt Maxim Long Life lamp has, in fact, a consumption of about 65 watts. Maxim told us that the Long Life lamps were first made in 1954 at the request of a few user customers who were mainly interested in purchasing them for use in the more inaccessible positions. 'Having designed the special Long Life lamps, we began to offer them to other user customers and found such a great acceptance of the idea of a longer life lamp that the business grew year by year and soon became a substantial part of our manufacturing range.' The lamps are sold to local authorities and commercial and industrial users who, Maxim has said, are more concerned with the life of the lamps than the small extra consumption of electricity. Maxim estimated that the Long Life lamp accounted for about 60 per cent of its production in 1967, but it thought that this percentage was likely to fall as it was making efforts to extend its trade from a mainly user market to include the retail trade, 'and we find the retail trade outlets

prefer 1,000-hour lamps and are not favourably disposed towards selling Long Life lamps'.

332. Fluorescent lamps, and some GLS lamps also, are purchased from other manufacturers for resale under the Maxim brand name; no sales are made to other manufacturers under their brand names. Retail list prices are recommended and are the same, type for type, as those of the principal manufacturers' main brands, but so far relatively few are retailed. Maxim employs sales agents on a commission basis; selling to various classes of customers and discounts are varied to suit the volume of business.

333. *Longlamps Ltd.* produces architectural filament lamps and fluorescent lamps at its factories at London and Reading. In 1967 it was acquired by the leading French lamp manufacturer, Compagnie des Lampes. Small quantities of lamps, mainly filament types not made by Longlamps, are imported from the parent company for resale under the brand name 'Iris'. *Lymelite Ltd.*, a small private company formed in 1948 to manufacture fluorescent lamps, started production with plant and equipment acquired from Barlite Ltd., which was in liquidation. The factory at Newcastle-under-Lyme produces fluorescent lamps in the 2-ft and 5-ft sizes. Lamps are supplied to other manufacturers under their brand names and some are sold to other own brand customers, including wholesalers. *Hivac Ltd.* was formerly a subsidiary of Automatic Telephone and Electric Co. Ltd. and became a wholly-owned subsidiary of the Plessey Company Ltd. in 1964. It makes reference filament lamps for use as panel indicators, switch indicators etc. at its factory at Ruislip. The bulk of sales is made to manufacturers of electrical equipment. *Zolta Electric Co. Ltd.*, a small private company formed in 1962, makes special types of filament lamps, mainly double-ended filament 'striplites'. More than half the production is sold to other lamp manufacturers, and most of the remainder to electrical equipment manufacturers.

334. In addition to the reference lamps imported by the principal manufacturers and by Longlamps, small quantities are imported by other suppliers, including a recently formed British subsidiary of Osram GmbH and a wholesaler who imports reference lamps from Westinghouse Electric Corporation of America.

CHAPTER 6

The Controlled Companies

The period 1951–63

335. We have described briefly in paragraphs 150 and 157 the establishment of the Controlled Companies by the members of ELMA in order to supply the cheap lamp sector of the market, to control that market with the least injury to their own higher priced brands and to use the companies, if required, as fighting companies. We have also recorded in paragraph 167 that in their Report of 1951 our predecessors said that the Controlled Companies had been left to run their businesses independently of the shareholders' management committees and that there was no evidence that they had been used as fighting companies. The Commission said that the preservation of the Controlled Companies, as providers of a measure of competition as suppliers of cheap lamps, would become of even more importance if ELMA or any of its members were to absorb any of the independent manufacturers, and although there was no evidence that either ELMA or any of the independent manufacturers were contemplating this absorption, the Commission could not ignore the possibility of its happening in view of the past history of the trade. The Commission recommended that if this should occur, or if the Controlled Companies should cease to practise an independent price policy, the position of the companies should be reviewed in the light of the situation as it would then exist. (One member of the Commission dissented from this recommendation and her separate recommendation is noted in the footnote to paragraph 165.) It is against this background that we have examined the position of the Controlled Companies since 1951.

336. The Controlled Companies group comprises Ismay, Britannia, Splendor, Evenlite and MSL (see paragraph 9). At the start of our inquiry, the shareholders were AEI L & L, Osram, Philips, Crompton and Cryselco, with a small outside shareholding in Britannia, which was then a public company. The present activities of the companies and the present shareholdings are given in paragraph 349.

337. No minutes or other records exist of any meetings of the Controlled Companies' Shareholders' Management Committee for the period 1951–63. Representatives of the shareholders told us on 9th February 1967 that the committee had not met as a properly constituted body in this period, but representatives had from time to time attended the regular board meetings of Ismay, Britannia and Splendor. As these representatives were not members of the boards, after the formal proceedings were finished informal discussions took place, in which the shareholders' representatives took part, in regard to the general affairs of the Companies, including such matters as trading and profitability. (Representatives of the shareholders were directors of Evenlite and MSL.) On the occasions when the shareholders had met for other purposes, for example after meetings of ELIC, the matter of the Controlled Companies would arise and would be discussed. We were told that apart from these informal discussions when certain decisions might have been taken, generally in regard to financial matters such as capital expenditure, the Companies had continued to operate with very little direct management by the shareholders.

338. As we have already indicated, the Companies operated, and continue to operate, only in the cheap lamp sector of the market. Up to 1954 sales by all

the Companies were increasing. Since the 1930's Britannia's main business had been the manufacture and supply of GLS lamps to Woolworth under the 'Sunshine' brand name, owned jointly by Britannia and Woolworth. In 1954 Britannia lost about half the Woolworth contract to Thorn, which started to supply GLS lamps to Woolworth, through the agency of the Universal Distributing Co. Ltd., under the brand name 'Vesta' (see appendix 1, paragraph 13). Britannia sold only to a very few multiple retail customers in addition to Woolworth and its sales in 1967 were still below the 1953 figure; we were told that Britannia did not aim to sell to buyers who would be in direct competition with Woolworth. Over the twelve years to 1967 Ismay's sales increased by about 75 per cent and Splendor's by about 50 per cent. Despite the loss of part of the Woolworth business, the profits of the Companies maintained an upward trend in the period 1957 to 1963, and by 1963 their cash resources from retained profits amounted to £325,000. The rate of net profit on capital employed in 1963 was said to be $8\frac{3}{4}$ per cent, or $7\frac{1}{4}$ per cent on turnover. Dividends declared and paid in the years immediately preceding and including 1963 were of the order of 15 to 25 per cent.

339. Throughout the years there was a policy of buying for distribution amongst the shareholders any outside shares in Britannia whenever these came on the market. We were told that the small outside shareholding presented problems in that the other Companies were private companies, and it was felt desirable to acquire complete control of Britannia. Steps were taken in 1965 to acquire the then few remaining outside shares and complete control was finally acquired in 1966.

340. The shareholders told us on 9th February 1967 that a belief on their part that the time had come to bring about some reorganisation within the Controlled Companies led to the regular meetings of the Shareholders' Management Committee which started in 1963. It was said that the Companies were financially healthy, were profitable and, apart from Britannia, were increasing their trade; 'on the other hand the shareholders, and indeed the management of the Controlled Companies, were realising that there was ever-increasing competitive pressure in the lamp industry and that some of their plant was of an age when there were certain problems involved in maintaining the current efficiencies at that time.' It was also said that in 1962 and 1963 the Companies' costs had risen* and that their plant was so out of date as to make them less effective in the market; however, the fundamental consideration in regard to the 'need for new plant came about in the feeling that the Companies should be re-grouped and no longer have three manufacturing sources but two, because plant which had given, and was giving, reasonably adequate service was of such an age that if it was taken up from the floor it was very unlikely that it could be reassembled to continue to produce at the same rate'. It appears that in 1963 75 to 80 per cent of the plant was pre-war although some of it had been modified in the Companies' own works. We were told that between 1951 and 1963 there were no official requests to the shareholders by the management of the Companies to sanction expenditure on new plant but the management had very often stated that they would like to have new plant. This they did not get in any significant quantity; and the shareholders told us that, although there was plenty of money available, they had not considered it appropriate to provide up-to-date lamp making plant in the Companies' factories. In

*Our subsequent inquiries showed that the Controlled Companies' production costs, per packed unit, of the standard 60-watt GLS lamp did not start to rise until 1964. In 1963, they were lower than in 1962 and about the same as in 1961.

the first place, such plant required staff with the necessary technical skill to get the best out of it. In the second place, the Companies' business was in a large number of different brands, and multi-brand business does not enable the user of up-to-date lamp making plant to get the maximum benefits from it because more operatives are needed to cater for this type of business than for constant long runs of one brand.

341. Early in 1963 the shareholders appointed a Managing Director of Britannia, Ismay, Splendor and MSL with a special mandate to examine the position of these companies and to draw up proposals for their complete reorganisation. The shareholders told us on 11th January 1967 that their request for this report arose from their decision for an investigation to be made 'into means whereby a proportion of the reference lamps manufactured by the Controlled Companies could be made for them by the partners'. Evenlite, which manufactured architectural filament lamps mainly for supply to the shareholders, was not to be included in the proposals. The Managing Director's report dated June 1963 said that the basic function of the Companies was to maintain an increasing share of the cheap market for lamps in the United Kingdom supported by such export business as could be economically achieved. Owing to the steady deterioration and obsolescence of much of the Companies' plant over a long period of use, the excess of floor area over actual requirements and the inadequacy of administrative co-ordination, the Companies' costs were running at too high a level to enable them to perform their basic function with maximum efficiency. The object of the reorganisation would be to reduce costs, co-ordinate selling effort and administration and so to improve substantially the competitive position and profitability of the Companies. The Director estimated that the Companies' sales of GLS lamps accounted for about 47 per cent of the cheap lamp home market.* The total market for GLS lamps was slowly expanding but the possibility was envisaged of a swing from the higher priced to the cheaper lamps with the growth of self-service and multiple retail outlets for lamps. The Controlled Companies, the report continued, 'have maintained their position in the market primarily on the basis of price, good service and personal contacts and to expand their share of the market they must be increasingly competitive in price while maintaining their standard of service. Many of their customers—in particular the larger ones . . . prefer to deal with the smaller manufacturer since they feel in a stronger bargaining position by so doing and it is, at present, essential to the economies of the companies that nothing should be done to jeopardise the sales to these customers. It is also the case with many of the smaller customers, that they prefer to deal with the smaller supplier with whom they can be on more intimate terms and to know that their lamps come direct from a manufacturer rather than from another wholesaler, however large the latter may be. Given the present standard of service provided to the Companies' customers, only price reductions can win any substantial share of their competitors' business and any selective reductions in price which are offered must be of a fairly substantial nature to affect the present division of the market more than marginally. It must also be borne in mind that the market generally was made aware of the relationship between the Controlled Companies and ELIC [ELMA] by the issue of the Monopolies Commission's [1951] report and many customers might well be reluctant to deal with the Controlled Companies if they seemed to lose any of their present relatively inde-

*It was subsequently estimated that the Controlled Companies' share of the cheap lamp market was 45 per cent in 1964; 40 per cent in 1965; 37 per cent in 1966; and 30 per cent in 1967.

pendent status. There is no doubt that any such change in status would very quickly become widely known in the trade.' The report proposed the concentration of GLS production at Britannia's works at Park Royal, the concentration of production of other types at Splendor's works at Wimbledon, and the closure and sale of Ismay's factory at Ilford. Initial investment in plant and modification to existing buildings for GLS production was estimated at £138,000 and, with provision for non-reference lamps, a total expenditure of £175,000 was proposed, to be followed by further expenditure on plant replacement at the rate of £50,000 a year. The Ismay site was thought likely to realise £200,000 and as the current cash resources of the three Companies amounted to £325,000, an amount of £350,000 would be available for distribution to shareholders. A maximum practical production of 36 million GLS lamps was assumed compared with the then capacity of 27 million. A substantial increase in sales was foreseen which it was expected would result in a considerable demand by the Companies for supplies of lamps from the shareholders for sales requirements of GLS lamps over the maximum production of 36 million. Improved rates of profit on investment were forecast.

342. The Shareholders' Management Committee met on 19th September 1963 to consider the Managing Director's report. With one exception, the representatives were not in favour of the Controlled Companies' production continuing at its then level; they considered that a proportion of the Companies' requirements of lamps should be supplied by the shareholders and that purchases of new machinery should be limited. (Up to 1963, purchases from the shareholders had consisted of high voltage lamps of over 200 watts of which the Companies made limited quantities only, and relatively limited and irregular purchases of candle lamps and strip lamps.) The Director was asked to revise his report and to produce new proposals more in line with what the shareholders had originally had in mind in calling for the report; 'the major respects in regard to the revision of the June plan were less expenditure on plant and more load for the shareholders'. The shareholders told us that 'it became increasingly evident that with the constant problems arising from increased costs the shareholders could provide the longer runs from their own efficient plant' where they said they had surplus capacity, and it seemed a natural consequence in a reorganisation to reduce the number of the Controlled Companies' factories and arrange for them to produce the shorter runs which were more suitable for smaller, slower speed production units. Another factor was the high on-cost resulting from the high rate of depreciation on new high speed units whereas the rate of depreciation on the old machinery was very small. The shareholders agreed, when we put the question to them, that their recent concern with the operations of the Controlled Companies, and their own expansion, individually, in the cheap lamp sector of the market had been occasioned by the rapid growth in this country of supermarkets, cash-and-carry grocery stores and the like.

343. The Managing Director's revised plan dated November 1963 proposed supply by the shareholders of a minimum of 10 million GLS lamps a year (together with increasing quantities of non-reference lamps) and provided for production by the Controlled Companies of 21 million GLS lamps a year. Plant requirements and alterations to buildings for GLS lamps were estimated at £105,000 and, with provision for non-reference lamps, a total revised expenditure of £140,000 was proposed. (We are told that the revised plan did not, in fact, lead to any significant reduction in the original expenditure proposed.) When the new proposals were considered by the Shareholders' Management Committee early in January 1964

there was certain disagreement between them as to the future of the Controlled Companies. Osram, while in general agreement with the new proposals, said there was some reluctance on the part of GEC to spend money on new equipment for the Controlled Companies partly because two of the shareholders, Philips and Crompton, were running their own cheap lamp businesses independently, and partly because there was no lack of production facilities in the Controlled Companies and new plant would, in some respects, make them more up-to-date than the shareholders' factories. Philips and Crompton were urged by the other shareholders to integrate their cheap lamp businesses with that of the Controlled Companies, but both were reluctant to do so since their principal competitor, Thorn, had a cheap lamp business. Opinion was divided on a suggestion that Thorn should be approached to integrate its cheap lamp business with that of the Controlled Companies. (No such approach was, in fact, made.) Osram and AEI L & L indicated that they were ready to move into the cheap lamp market independently of the Controlled Companies, if necessary; all the shareholders agreed that this could mean the ultimate closing down of the Controlled Companies. Philips mentioned the possible loss of component business should part of the Controlled Companies' lamp requirements be drawn from the shareholders, but the other shareholders considered that as there was no guarantee of this business continuing indefinitely, this aspect could not be taken into account.

344. According to the minutes of a meeting of the Shareholders' Management Committee held on 18th February 1964 Philips and Crompton indicated that they were agreeable in principle to giving up their respective second brands, Corona and Hygrade, provided that certain other brands were also brought within the scope of the Controlled Companies' activities. Philips would not be willing to invest further in the Companies unless such an arrangement was made and, if it was not made, it might withdraw altogether. Osram considered the Controlled Companies to be reasonably successful and wished to see them more so; this would not be possible if Philips and Crompton continued with their second brands. Osram reminded the other shareholders that it and AEI L & L could combine and take all production between them. AEI L & L said it did not want to start a second brand but would feel forced to do so if Philips and Crompton continued with theirs and Osram started with one. There was some discussion about a possible re-allocation of shares in the equity of the Controlled Companies. It was agreed that an early decision on outstanding problems was essential in order that the reorganisation of production could proceed. The shareholders were said to have enough production capacity to obviate the need for putting new plant into the Controlled Companies.

345. At a meeting of the Committee held in July 1964 the changed position resulting from the formation of BLI was discussed. The record indicates that BLI, now a shareholder through its subsidiary, AEI L & L, did not support any increase in GLS production by the Controlled Companies and considered that any increase in demand should be met by supplies from the shareholders. Osram did not want to see the shareholders competing with the Controlled Companies and wanted this factor resolved before any plans were finalised. The meeting considered that if the Resale Price Maintenance Bill was passed 'the Controlled Companies would be in a better position to compete with Luxram since they could no longer be expected to ensure that their customers did not undercut Woolworths'. It was decided to increase the dividends to be paid by Ismay and Splendor but not to increase that of Britannia. It was agreed at a further meeting held on 4th November 1964 that GLS production should be limited to 20 million,

not 21 million, and that the shareholders would supply the balance of about one-third of the requirement, to be allocated between them on the basis of their respective shareholdings, taking into account wattages and unit ratio values. The ratio values to be used for converting the different wattages into unit values were set out and agreed. The 60-watt clear GLS lamp was taken as the basic unit at 1·00, with lower and higher ratio values for the lower and higher wattages. (A similar type of formula had been used under the quota provisions of the Phoebus Agreement and the 1948 Lamp Agreement, see paragraphs 153 and 159.) The agreed price to the Controlled Companies was the same as the Controlled Companies' budgeted cost of production per packed unit for the post re-organisation period. The meeting was of the opinion that new lamp-making units should not be purchased if something adequate could be provided from the shareholders' surplus plant. The Director of the Companies, who was present at the meeting, said that units capable of producing about 1,750 lamps an hour, without the heavy losses now being experienced, were required. It was finally agreed that two new units should be purchased if the shareholders' production representatives considered that suitable used machinery was not available. The shareholders also agreed that it should be made clear to all the Controlled Companies that no restrictions were to apply to freedom of purchase of supplies of any kind (including plant, raw materials and components) in the drive for efficient and economical operation. Preference should, however, be given to the shareholder companies when all other conditions were equal.

346. At a meeting of the shareholders' production directors held on 17th December 1964 it was agreed that, since there was no suitable plant available from the shareholders, the Controlled Companies should purchase two new GLS units, as the first stage of a five year plan. The sale of Splendor's factory at Wimbledon and a small property adjoining the Ilford factory realised £234,000; part of the plant from Wimbledon was transferred to Britannia's factory at Park Royal where the new plant authorised was subsequently installed, and Britannia became the main manufacturing and selling company for the group. It was recorded that the price of supplies from the shareholders was to remain firm for twelve months from the start of supply, and was to be subject to annual review thereafter in the light of movements in the market prices of lamps. However, we were told that, in fact, the price was never reviewed on that basis and that the costs of production would have been a determining factor in any such reviews.

347. The rates of dividend declared and paid by Ismay and Splendor for the years 1963/64 and 1964/65 were much higher than those for the preceding and succeeding years; those declared and paid by Britannia remained the same throughout (see paragraph 345). The total amounts paid in dividends by the three companies in 1963/64 and 1964/65 were £81,922 and £176,553, respectively, compared with the total of £49,000 for 1962/63. The Controlled Companies told us that the dividends paid in 1963/64 and 1964/65 were more than balanced by the sale of the Wimbledon and Ilford properties and that the liquidity position of the Companies (£325,000 in 1963) was not materially different in 1965 and 1966 than previously. During 1965 and 1966 excess stock was built up to the value of £120,000 and capital expenditure of £170,000 was undertaken; this, we were told, necessitated overdraft facilities on the Companies' own security of up to £250,000, and it was anticipated that a continuing overdraft facility up to about £150,000 to finance working capital would be required in the foreseeable future.

348. In 1967 it was decided that the Park Royal factory had proved to be uneconomic for a number of reasons, including the availability of suitable labour,

and it was closed and the plant was moved to the Ilford factory. Britannia became a wholly-owned subsidiary of Ismay, and there were certain minor consequential changes in the shareholdings in the other companies.

The present position

349. The shareholdings in the Controlled Companies (which are held by nominees in all cases), and the principal activities of each company in relation to reference lamps, are now as follows:

Ismay. Manufacture and sale of GLS filament lamps.

	Per cent
AEI L & L	43·7520
GEC	30·2795
Crompton	12·6310
Philips	9·2505
Stella	0·9393
Cryselco	3·1477

Splendor. Sale of GLS filament lamps.

	Per cent
AEI L & L	43·9733
GEC	29·9083
Crompton	12·4184
Philips	10·0167
Cryselco	3·6833

Evenlite. Manufacture and sale (mainly to shareholders) of architectural and other tubular filament lamps.

	Per cent
AEI L & L	43·975
GEC	33·600
Crompton	12·425
Philips	10·000

MSL. Concerned solely with non-reference lamps.

Ismay has the following wholly-owned subsidiaries:

Britannia, now a selling company for GLS lamps for the group. Britannia has two subsidiaries, *Gnome Electric Lamp Works Ltd.* and *Noma Electric Co. Ltd.* both of which are concerned with sales of non-reference filament lamps, mainly miniatures for decoration and motor lamps.

Union Lamp and Lighting Co. Ltd., wholesalers, sells reference lamps mainly to large users under the brand name 'Union'.

Briton Lamps Ltd., formerly a buying company, whose name is used for exported lamps.

CEL Ltd., also concerned with exported lamps.

Machine Design and Construction Ltd., which makes and sells lamp-making machinery and parts.

350. As we have shown in chapter 5, all the shareholders (apart from the selling company Cryselco, owned jointly by GEC and Philips) are now in direct competition with the Controlled Companies in the cheap lamp sector of the market. Their individual interests are:

BLI. Omega, acquired by Thorn in 1957. Astralec, formed by Thorn in 1962 to handle sales to Woolworth.

Osram. Ascot, acquired in 1965.

Philips. Corona* formed in 1961. Controlling interests in Luxram and Kingston, acquired in 1965 and 1966 respectively.

Crompton. Hygrade brand.

This compares with the position in 1951 when only Crompton of the then shareholders had any significant interest in the cheap lamp market, and in 1963 when only Crompton and Philips had such interests.

351. Sales of reference lamps of the Controlled Companies' own production in the three years to 1967 were:

1965	1966	1967
(£'000)	(£'000)	(£'000)
1,067	792	965

As already mentioned, production of GLS and other filament lamps sold by Ismay, Britannia and Splendor is now concentrated at the Ilford factory. GLS lamps are made to BS 161 and are guaranteed for 1,000 hours. They are single-coil only, most have a metal fuse and are primarily in the domestic 15- to 200-watt range, pear shape and mushroom. The light output of the metal fused lamps is said to be marginally below that of single-coil main-brand lamps which have glass fuses, because of the particular mixture of gases required for the metal fuse. The older type of lamp-making units, we were told, are not capable of working with two glass fused electrodes. Glass fused lamps could be made by the Controlled Companies on the new units for supply to customers who specify them, but the Companies say that they cannot supply a mix of types to other customers, and production is therefore concentrated on metal fused types. About 25 per cent of total sales of GLS lamps are 250 volts, and 2½ per cent are 260 volts; the Controlled Companies told us that 'a number of our own brand customers take 250 volt, in some cases 260 volt, lamps to obtain longer burning life'. In August 1967 the Companies started to produce long life lamps for supply under the name 'Dualife'; these lamps are made to the Companies' own design which approximates to the IEC 64A specification for a 2,500-hour lamp. The lamps, which at present represent about 2 per cent of the Companies' total GLS sales, are sold mainly to trade users 'since the main advantage of this type of lamp is related to labour saving in industrial and commercial use rather than in the domestic market'. One wholesaler in Scotland buys the lamps for resale under its own brand name 'Scotram'. The Managing Director told us that he did not think many members of the public, unless they got a lamp with a particularly short life, noticed when they put a lamp in, and very few really knew for how long a lamp had burned. There was very little indication that the general public were looking for longer life in lamps, although there was some demand from industrial users. The industrial user who bought long life lamps would check to make sure that he was getting what he was paying for and there would be no question of lamps failing before the guaranteed life. The different filament used, and the level of lamp rejects in manufacture, increased the cost of such lamps, and he doubted whether the general public would be prepared to pay more for longer life. On the question of information to the consumer about life and the effects of under-running, he told us that Britannia had been criticised by the Consumers' Association in *Which?* in 1961 because Britannia was at that time supplying Woolworth with 250-volt lamps marked 240 volt which, accordingly, had an average burning life

*This company has ceased to trade, and only small quantities of Corona lamps are now produced.

of about 1,800 hours when under-run on 240 volts. *Which?* had said that the light output, as a result of under-running, was unsatisfactory. Britannia had not since then supplied lamps which were of a voltage rating other than that marked on the lamps. 'We depend on the customers to say "We want 250-volt filament". If they say that, they get it.'

352. The shareholders told us in July 1967 that, following the decision to close the Park Royal factory and the removal of the plant to Ilford, production of reference and non-reference lamps would be concentrated at Ilford where the new plant, with the existing and relatively modern plant installed there, would provide at least 50 per cent of the Controlled Companies' requirements of reference lamps on current sales forecast. The balance would be made available by those shareholders who had facilities to supply at costs per type acceptable to the Controlled Companies in relation to current market prices. 'The Shareholders and the Management of the Controlled Companies are aware that the factor of low cost is not the complete answer to competitive trading and in concert with the move to one factory a considerable effort will be made to reduce operating overheads and stocks which are higher than are considered necessary for the type of market with its existing price levels.'

353. Reference lamps supplied to the Controlled Companies by the shareholders are branded in accordance with the Companies' requirements, and are packed by the shareholders in specially printed packing sleeves and labelled cartons. The lamps ordered from shareholders are generally bulk requirements of the Sunshine brand lamps for Woolworth and the Companies' own brands, Ismay, Splendor, Castle and Metram. There are no contracts or written assurances of maintenance of supplies by the shareholders but we were told that 'all the arrangements for the supply of lamps are minuted'. The Managing Director told us that he thought that all the Companies' customers were aware that some of the lamps supplied were, in fact, made by the principal manufacturers, but the Companies' business had not been affected by this knowledge. He said 'You cannot keep any secrets in the lamp trade.' The Controlled Companies are not left entirely with short production runs and they retain some major brand production, but it was said that 'the transfer of bulk business had some effect on their cost problems'.

354. The shareholders told us in February 1967 that in 1963 it had seemed to them to be common sense to fix a price based on the Controlled Companies' previous year's costs. Had the annual reviews, as originally intended, been applied rigorously since 1963 the Controlled Companies could have been put in an extremely invidious position, particularly in 1966/67 when, because of the reorganisation, their costs had soared. The shareholders said that the general rise in costs would, however, affect their ability to continue to supply at the 1963 price, which had not then been varied. They said that the business had not, however, been unprofitable to them.

355. A proposal to increase the unit price on supplies from the shareholders by 7·7 per cent on 1st April 1967 was not implemented at the time, but the controlled Companies abandoned the unit ratio basis as a method of calculating their costs and adopted a standard costing system for each type of lamp. In June 1967 BLI quoted to the Controlled Companies new prices at which it was prepared to supply for the year 1967/68. The prices, retrospective to 1st April 1967, were accepted by the Companies, which then negotiated similar prices with the other

shareholders. (We were told that one shareholder had negotiated a higher price for a particular lamp which could not at the time be obtained from elsewhere; but that this had been a temporary measure only.) We were also told that the quantities supplied by the shareholders no longer bore strict relationship to their shareholdings; the arrangements were now more flexible and enabled the Companies to obtain their requirements from any shareholder who happened to be best able to supply at a particular time.

356. Sales to Woolworth, to other buyers of own brands, and unbranded lamps* account for about 65 per cent of total sales of reference lamps; and sales of the Companies' own brands account for about 35 per cent. In addition to Woolworth, customers' own brands are supplied to four retail chains, fifteen wholesalers, two small lamp manufacturers, an electricity board and BR. Normally, a customer's own brand is supplied only for a minimum order of 50,000 lamps of one size of bulb in any one year; we were told that this is because 50,000 packing sleeves is an economic quantity to buy.

357. What were three separate management and sales organisations for reference lamps have been largely integrated, although the individual travellers generally handle only one brand on account of the brand goodwill which exists. Two new depots have been established, making a total of three. The Managing Director told us that there is no rigid price or discount structure and that selling prices are continually under review and are constantly subject to change. Sales to own brand customers are at negotiated prices without regard to list prices and no retail prices are recommended or suggested. The Director said 'in a lot of areas lamps are passed round from one supplier to another. They may be sold two or three times before they eventually reach the public. We try not to get involved in inter-retailer disputes as to resale price levels.' The list prices of the Companies' own brands are the same, type for type, as those of the shareholders' main brands, but the discounts off list prices allowed to distributors and commercial and industrial users are generally higher than those that apply to main brands. The retail list prices (excluding purchase tax) of 'Dualife' lamps are 1s. 7½d. for the 25- to 60-watt and 1s. 11d. for the 100-watt compared with 1s. 6½d. for the 1,000-hour lamp of both wattages; and 2s. 6d. for the 150-watt compared with 2s. 0d.

358. We were told by the Controlled Companies in January 1967 that the shareholders did not direct or interfere in the commercial policy of the Controlled Companies, although through the Shareholders' Management Committee they 'see our budgets and our results and they comment from time to time on the level of selling prices when they think we are selling at too low a price, in other words if they see (leaving out the reorganisation period) a particular range of customer is buying at prices which are too low they require us to explain why this is and to justify it. Unless we can come up with a good reason they suggest, tactfully, we might like to withdraw from that particular market'. It was subsequently explained to us that until 17th March 1967 the Shareholders' Management Committee saw monthly trading reports which did not give selling prices of individual lamps but average realised prices to categories of customers. Sometimes there

*These lamps bear the rated wattages and voltages only. They are supplied by the Controlled Companies mainly to wholesalers who do not wish to buy one of the Companies' brands and whose businesses do not warrant a brand of their own. A large proportion of coloured lamps supplied by the Controlled Companies, other than to Woolworth, are retailed unbranded.

was only one customer in a particular category. These arrangements were then changed, and the trading reports are now presented in an entirely different form which makes it impossible to identify the prices to any individual customer. The structure of the Shareholders' Management Committee, which normally meets every second month, has also been changed. Whereas formerly the shareholders were represented by commercial and policy making representatives, the Committee now consists of production and technical representatives. The costs and profits of the Controlled Companies for the period 1963–1966 are dealt with in chapter 10.

CHAPTER 7

The Suppliers of Components for Electric Lamps

359. We have referred briefly in paragraph 11 to the suppliers of the principal components for reference lamps, namely, Lamp Caps, Glass Bulbs, Lamp Metals and GTC, the four companies owned jointly by BLI (through AEI L & L) and GEC; Lamp Presscaps, a subsidiary of BLI; Mullard, a subsidiary of Philips; and Chance Bros, a subsidiary of Pilkington. At the time of our predecessors' inquiry in 1949–51, there were only two components companies jointly owned by AEI and GEC, Lamp Caps and Glass Bulbs. The position in 1951 and the considerations taken into account by our predecessors regarding the supply of components by these two subsidiaries of members of ELMA, and by the other members of ELMA, are outlined in paragraph 161. We have set out in paragraph 114 our predecessors' recommendation that ELMA should undertake that members who sold lamp components (other than patented components and ready-coiled filaments) would make them equally available to members and non-members at prices which should not be higher to non-members than to members, subject possibly to lower prices being charged to parent, subsidiary or fellow subsidiary companies of the supplier. ELMA's subsequent undertaking relating to this and our predecessors' other recommendations are dealt with in paragraphs 167 and 170.

360. *Lamp Caps Ltd.*, the first of the jointly owned components companies to be formed by AEI and GEC, was set up in 1922 to take over the then parent companies' cap making interests. Until 1967 Lamp Caps made a range of the common bayonet type, and also the screw type (still used generally on the Continent), of vitrited (glass insulated) caps for filament lamps and some discharge lamps; Lamp Presscaps (a subsidiary of Thorn until 1964) made a range of vitrited caps, and was the sole supplier in this country of bi-pin caps for fluorescent lamps. Lamp Caps and Lamp Presscaps, between them, supplied virtually the whole of the cap requirements of the electric lamps industry in the United Kingdom. They also exported caps. Relatively small quantities of lamp caps were, and are, imported; mainly automobile and other special purpose types from NV Vitrite, a subsidiary of NV Philips, which has no selling agent in this country.

361. We understand that by 1959 it had become apparent that cap manufacturing capacity in this country would need to be expanded, and there were preliminary discussions between Thorn and the parent companies of Lamp Caps about the possibility of the formation of a joint cap factory. There was no space for expansion at Lamp Presscaps' factory at Edmonton and efforts to increase production at the factory raised certain problems, including that of effluent treatment. We were told that Lamp Presscaps was faced with the alternatives of establishing a new factory almost certainly some distance away or of merging in whole or in part with Lamp Caps which had room to expand at its Chesterfield factory. Both possibilities were discussed both before and after the formation of BLI in 1964, but little progress was made. The minutes of a meeting of the Thorn Executive Board held on 14th August 1964 recorded that it had been agreed that sufficient time had elapsed since the formation of BLI to make it permissible for Lamp Caps and Lamp Presscaps to increase their prices to outside customers. In reference to this record, BLI has explained that before the announcement of the merger at

the end of May 1964 'both Lamp Caps and Lamp Presscaps had independently decided to increase cap prices due to greatly increased manufacturing costs, in particular, due to the price of copper. After the formation of BLI it became apparent that both companies had good reason to increase prices but it was considered that it would be unwise to announce these increases under the immediate impact of the announcement of the formation of BLI. The minute extracted meant that it was then considered that sufficient time had elapsed since the announcement of the merger for the previously planned price increase by Lamp Presscaps to be put into effect.' In August 1966 Lamp Caps told us that its selling prices to the parent companies were based on 'cost plus five per cent'. No price list or quantity discount scales had been published since 1957, but the potential value of annual business was said to be taken into account in quoting prices to other customers.

362. In order to illustrate the principles involved in its sales policy, Lamp Caps submitted a schedule showing its 1965/66 selling prices to a number of customers of the three types of vitrited cap (Standard Bayonet BC, Edison Screw E27 and Goliath Edison Screw E40) which, together, represented about 89 per cent of its total sales, by value, of caps for use in the manufacture of reference lamps in 1965/66. The following is an extract from the schedule:

Customer	Quantities ('000) BC	E27	E40	Price per 1,000 BC	E27	E40
				£ s. d.	£ s. d.	£ s. d.
Osram	52,049	10,424	1,540	2 15 3	2 12 9	9 5 9
AEI L & L	39,461	2,052	1,323	2 15 3	2 12 9	9 5 9
Together	91,510	12,476	2,863	—	—	—
Britannia	11,553	200	40	3 6 3	2 19 3	11 16 9
Ismay	10,405	750	55	3 6 3	2 19 3	11 16 9
Evenlite	125	—	—	3 8 0	—	—
Crompton	16,780	1,500	—	3 0 9*	2 18 3	—
British Luma	240	—	—	3 6 6	—	—
Kingston	2,692	250	212	3 6 3	3 1 6	12 3 0
Philips Electrical†	3	301	111	3 13 3	3 2 3	13 1 3

*We were told that this was a special price for caps delivered in bulk containers and that this method of delivery represented a considerable cost saving to Lamp Caps.
†In 1965/66 Philips Electrical obtained the bulk of its requirements of standard vitrited caps from Lamp Presscaps.

363. Discussions about a joint cap factory were resumed in 1966 and it was finally agreed to concentrate production of vitrited caps at Chesterfield by the purchase by Lamp Caps of Lamp Presscaps' business in this type of cap, and to expand Lamp Presscaps' production of bi-pin caps at Edmonton. The merger became effective on 1st January 1967, and for the next four months Lamp Caps and Lamp Presscaps were involved in the transfer of machines and stocks and in interim arrangements for the maintenance of supplies. Before the merger Lamp Caps supplied about 70 per cent by number of the vitrited caps produced in this country and Lamp Presscaps supplied the other 30 per cent. Lamp Caps is now the sole manufacturer in the United Kingdom of vitrited caps; it continues to make special types of bi-pin caps for certain discharge lamps and has a very small trade in pressings for electronic components. Lamp Presscaps, whose present activities are dealt with in paragraphs 367 and 368, continues to be the sole manufacturer in the United Kingdom of bi-pin caps for fluorescent lamps. (The

company's separate manufacturing facilities for products not concerned with electric lamps, which were transferred to Thorn in 1964, remain under its management and the costs of management are recovered in full from Thorn.)

364. The terms on which Lamp Caps acquired the vitrited caps assets of Lamp Presscaps were not embodied in a formal agreement, but were set out in the ollowing extract from the minutes of a meeting of the Board of Lamp Caps held on 23rd November 1967:

Integration

The following report on the Integration of Vitrited Cap Production was approved and adopted.

1. The whole of the plant formerly operated by Lamp Presscaps Limited for the manufacture of glass insulated caps has been purchased by the Company for the sum of £90,561, which represents the written down valuation for Corporation Tax purposes at the 31st March 1966, plus the cost of additions since that date, plus the agreed sum of £5,000. Spare parts, furnace blocks and tools (valued according to the basis of valuation adopted by the Company in its financial accounts) amounting to £30,480 have also been purchased.

2. The dismantling of the Lamp Presscaps Limited plant and its transport to Chesterfield has cost £6,502 and these costs have been paid by the Company as agreed.

3. All Lamp Presscaps Ltd. stock holdings relating to vitrited caps have been transferred to the Company and the valuation has been in accordance with the principles adopted by Lamp Caps Limited when valuing stocks. Stocks acquired were as follows:

(a) raw materials and components	£32,535
(b) work in progress	£58,149
(c) finished goods	£63,652

The valuation of each line of stock has not exceeded the relevant selling price less the selling costs and it has been on this basis that the provision for obsolescent and slow moving stocks has been computed.

4. The cost of maintaining stocks at the Lamp Presscaps Limited store since the agreed date of 31st December 1966 amounting to £2,009 has been met by the Company.

5. Lamp Presscaps Limited initially despatched some of the stock direct to customers, and in so doing incurred distribution costs of £330. The Company has reimbursed Lamp Presscaps Limited for this sum.

6. Revenue expenditure of a non-recurring nature, amounting to £25,067, incurred in relation to the acquisition of the plant and stocks from Lamp Presscaps Limited, has been carried forward in the accounts at 31st March 1967. This sum will be written off in the accounting period 1st April 1967 to 31st March 1968.

At the same Board meeting it was agreed that Lamp Caps would pay a service charge to BLI for its management of the company. Starting on 1st April 1967 for a period of seven years ending 31st March 1974, when the net profits of Lamp Caps (before corporation tax) exceed £100,000 in any one year, a service charge will be paid to BLI by Lamp Caps made up as follows:

(a) the first additional £25,000 in excess of £100,000
(b) 20 per cent of any further profits in excess of £125,000.

If the aggregate service charge received by BLI during the seven year period totals less than £250,000, supplementary service charges will be payable in the three years ending 31st March 1977. These supplementary charges will be limited to £25,000 in each year representing the first £25,000 profit earned by Lamp Caps in excess of £100,000 each year. The total of the supplementary service charges will be limited to the amount by which the service charges payable in respect of the seven years ending 31st March 1974 falls short of £250,000.

365. In December 1967 Lamp Caps clarified its sales policy as it had stated it to us in August 1966 before the merger (see paragraph 361). It said that although no price lists or quantity schedules had been published since 1957, that was not to say that at any time customers and the company's own sales staff were not aware of the prices at which the company was prepared to supply caps for reference lamps in normal demand. The prices were based upon the history of past trading and the normal commercial processes of quotation and negotiation, and they reflected the volume of the customer's business, the company's costs and the margin of profit aimed at and also the competition from foreign suppliers. For example, a general price increase of $1\frac{1}{2}$ per cent with an additional 10 per cent on nickel plating charges made in October 1967 was occasioned by the surcharge on fuel oil prices and an increase in the price of nickel.

366. Later in the same month Lamp Caps clarified the position further, and said that:

(i) before 1951, it had three price lists; to parents, to other members of ELMA and to all other customers;

(ii) after the undertaking in 1951 not to differentiate between customers, from 1951 to 1957 there were two price lists; one to parents, and one to all other customers based on standard prices and predetermined quantity discounts.

It was found that each of the price lists at (ii) had drawbacks. In the case of the parents, it meant that the parent taking the larger quantity was contributing to the other parent's dividends as the dividends were shared equally. In the case of other customers, the fixed prices and quantity discounts made it difficult to compete with Lamp Presscaps and NV Vitrite. In 1957 the then existing price lists and discounts were abandoned, and the following new arrangements were introduced:

(i) parents took supplies at 'cost plus 5 per cent', which terms still apply;

(ii) initial prices to all other customers were the same as the previous standard list prices less appropriate predetermined quantity discounts. These prices have been varied by negotiation, as described in paragraph 365.

367. *Lamp Presscaps Ltd.* continued to produce vitrited caps until June 1967; these were supplied to Lamp Caps at Lamp Caps 'factory transfer prices'. Lamp Presscaps also recovered from Lamp Caps certain expenses of stock maintenance and distribution as provided by the terms of the merger (see paragraph 364). We were informed that before the merger of cap interests Lamp Presscaps' prices to BLI were negotiated 'at arms length', and that all other customers paid 'the same sort of prices' quantity for quantity.

368. Further inquiries showed the following prices charged for the main types of caps in 1966/67.

	Prices per 1,000 caps		
	Vitrited caps		**Bi-pin caps**
	Standard bayonet	Edison screw	
	s. d.	*s. d.*	*s. d.*
BLI	60 3	57 9	72 0
Osram	—	—	85 0
Philips	71 9*	72 0	—
British Luma	74 0	—	—
Maxim	75 0	—	—
BELL	76 0	—	—

*The cap supplied to Philips at this price varies slightly from the standard type and is marginally more costly to produce.

The price to Osram for bi-pin caps was reduced after the merger to 75s. 0d. per 1,000. Although this reduction was not a condition of the merger, it may be said to have resulted from it in that it was considered that, in the new conditions, the differential between the prices to BLI and to Osram should be less marked. From the details shown above and certain explanations given to us, it appears clear that prices charged to BLI were comparable with the standard price to parents charged by Lamp Caps, and that the prices to other customers were related roughly to quantities. We understand that prices of standard bayonet caps to Philips were fixed at a level to obtain the best price without encouraging Philips to import from NV Vitrite. (Bayonet caps would be a low volume production item for NV Vitrite, and consequently relatively costly.)

The observations of other manufacturers on the Lamp Caps/Lamp Presscaps merger

369. Following the publication of the proposed acquisition by Lamp Caps of the interests of Lamp Presscaps in vitrited caps, the Board of Trade announced that they would not refer the merger to this Commission. The Board told BLI and GEC that in reaching this decision they had had in mind the fact that the supply of certain descriptions of electric lamps was currently under investigation by the Commission, and that no doubt the Commission would bear in mind the new situation created by the merger in their investigation of the lamps industry generally.

370. In furtherance of our consideration of this matter, in May 1967 we invited the manufacturers of reference lamps (apart from BLI and Osram whose separate comments on the merger, and also on the comments of the other manufacturers set out below, are in chapter 11) to submit any representations or comments on the merger which they might wish us to take into account.

371. Philips said on 14th July 1967

> The recent acquisition by Lamp Caps Ltd. of Lamp Presscaps Ltd.'s business in vitrited caps has resulted, so far as we know, in a situation where Lamp Caps is the sole manufacturing source in the United Kingdom of vitrited caps. This cannot be said to be an ideal situation from the point of view of a lamp manufacturer dependent upon a supply of caps. Initally the Lamp Caps merger resulted in a deficiency in supplies to Philips Electrical both from a quality and quantity point of view and in consequence in the early months of this year we had to import by air, at very short notice, a quantity of lamp caps from Holland to bridge the gap caused by initial difficulties at Lamp Caps' Chesterfield factory. These initial difficulties however were soon overcome, and we wish to confirm therefore that the current position in relation to the supply of lamp caps from United Kingdom sources to meet our present requirements is reasonably satisfactory. In as much as we wish from time to time to import lamp caps from the continent, we would take this opportunity of pointing out that the burden of import duties on lamp caps is a matter which we cannot ignore. We somewhat doubt whether the supply position as it has now evolved in the United Kingdom really justifies in the national interest, the continuation of import duties on lamp caps. We have to date taken no steps to apply to the Board of Trade or Treasury for exemption from, or repeal of, import duties applicable to lamp caps. We would express the view however, that in the event of the supply of lamp caps from United Kingdom sources deteriorating, either as to price, delivery, quality or quantity, resulting in a need to increase our importation of lamp caps, we may well wish to refer the position to the Board of Trade for their consideration. We are watching the position carefully, and although at present the main GLS types of cap from Lamp Caps Ltd. are competitive on price, we will hope to see a continuing reduction in price on their supplies on certain types, particularly the smaller sign lamp caps. As to the availability of types from Lamp Caps Ltd. we have one problem in particular which

relates to caps for fluorescent tubes. The lamp caps manufactured by Lamp Caps Ltd. for fluorescent tubes are of a particular type of construction and appearance from which they can be identified as being Thorn caps. This presents certain marketing problems both in home and export markets. On the home market it results in a situation where the caps on Philips fluorescent tubes are indistinguishable from those on Thorn tubes. The problem is of greater significance in relation to exports because due to standardisation requirements of Philips on the continent, the Thorn type cap cannot be used on that part of our Hamilton production which is destined for export, and in this case we are obliged to import caps for export requirements.

372. *Luxram* considered that it was always better to have two firms rather than one negotiating for its business and added that the two cap companies 'have always kept their prices just about at the same level as we could buy from abroad, taking into consideration the duty which would be payable on imported material.' Luxram is buying caps independently of Philips. *Kingston* said 'We are now deprived of an alternative source of supply should one supplier be out of stock of any particular item; this merger took place only a short time ago and it is rather early to have any experience on which to comment properly.' Kingston is now buying against Philips' contract with Lamp Caps.

373. *Crompton* considered 'that a monopolistic situation exists particularly in relation to bayonet caps where the continent of Europe offers no competition. Substantial price increases have been made in the last few years and the latest price of the standard BC cap is the same as that for last year's contract despite a very considerable fall in the price of copper. As the only shareholders in Lamp Caps Ltd. are BLI and GEC it is in their interests but not ours to keep cap prices at a high level.' Crompton also considered that the prices charged by the two cap companies were unduly high compared to prices quoted by NV Vitrite because where there had been competition from NV Vitrite its prices, which include import duty, were often lower than those of the United Kingdom companies.

374. *BELL, Maxim and Viking* viewed the merger with suspicion, as it left only one source of supply of vitrited caps in the United Kingdom. *Maxim* said that now that all vitrited caps come from one supplier 'this obviously is a disadvantage unless of course Lamp Caps have given the Government an undertaking that supplies will be made freely available to the trade and that prices charged will be competitive with world supplies of caps.'

375. *Longlamps* said 'We were first advised of this amalgamation by Lamp Presscaps Ltd. on 12th January 1967 and whilst we have noted no change in the degree of service or availability, we have received from each company notification of price increases of the products of both and both have offered the reason for the increases as being due to the increased costs of raw materials, notably copper and brass. Both notifications of these price changes were received in March of this year.'

376. *Zolta and British Luma* considered that in the past they could buy vitrited caps from Lamp Presscaps at lower prices than were charged by Lamp Caps since the merger. *Zolta* also said that it had obtained quicker delivery from Lamp Presscaps. Details supplied by *British Luma* showed that since October 1965 the two cap companies had submitted level tenders for vitrited caps, whereas before 1965 Lamp Presscaps' prices had been lower.

377. *Hivac and Lymelite* had no comments on the merger.

378. *Glass Bulbs Ltd.*, the second of the jointly owned components companies to be formed by AEI and GEC, was set up in 1948 primarily to operate the two ribbon bulb making machines imported from the USA. It was estimated in 1951 that the potential annual output of all articles by the machines (which can make other products as well as bulbs for electric lamps) was 450 million. This potential, with such other machines as were retained for the production of special types of bulbs, was far in excess of the then requirements (and of the current requirements) of the United Kingdom lamps industry, and a large proportion of production was and is exported (65 per cent in 1967). In 1951 Glass Bulbs confirmed that the bulbs made on the ribbon machines would be distributed without discrimination, and that the prices charged would be the same—quantity for quantity—to all purchasers in the United Kingdom, with the exception that the proprietors would purchase at lower prices, as would the Controlled Companies since it was considered that the joint proprietors had an obligation to the other shareholders in the Companies. An agreement dated 14th December 1948 between BTH (subsequently substituted by AEI L & L), GEC and Glass Bulbs, which has been registered with the Registrar of Restrictive Trading Agreements, covered the grant by the shareholders to Glass Bulbs of patent licences and the provision of know-how, and it provided, inter alia, that the prices to be charged by Glass Bulbs to the shareholders should be total cost plus 6 per cent, or such other percentage as might be agreed by the shareholders.

379. Glass Bulbs publishes standard list prices for lamp bulbs. There are special arrangements for the parent companies, Philips and the Controlled Companies. Other customers buy at list prices less quantity rebates. These arrangements are said to implement the undertaking given in 1951. BLI and Osram confirmed our understanding that as bulbs are a standard product manufactured in long runs on highly automatic machinery the actual cost of manufacturing a bulb is the same for whichever customer it is produced. They said that the differences in the prices charged to different customers are due to commercial considerations which are based primarily on the buying power of a particular customer, but must also reflect the differences in cost of distribution.

380. Details of the pricing arrangements are as follows:

(i) to parents, cost plus 6 per cent;
(ii) to Philips, cost plus 17½ per cent;
(iii) to the Controlled Companies, list prices less rebate of 17½ per cent;
(iv) to other customers, list prices less the following quantity rebates.

Quantity (*millions*)	**Rebate** (%)
0 up to 2·5	nil
2·5 ,, ,, 5·0	2·5
5 ,, ,, 10	5
10 ,, ,, 15	7·5
15 ,, ,, 20	10
20 ,, ,, 30	12·5
30 and over	17·5

(v) all customers receive a transit breakage allowance of 2½ per cent and, apart from parents and Philips, a monthly settlement discount of 2½ per cent.

Glass Bulbs explained that the terms to Philips were related to a 10-year contract covering total annual purchases in excess of 30 million bulbs. The contract expired in 1966 but we understand the terms are unchanged, as is the minimum qualifying annual quantity taken by Philips.

381. The above pricing arrangements resulted in the following actual prices paid by a selection of customers for two types of bulbs required in large volume:

Type	Standard list price	Price per 1,000 bulbs				
		Parents 1965 Cost +6%	**Philips** 1966 Cost +17½%	**Controlled Companies** 1965/6 List −17½%	**Crompton** 1965/6 List −12½%	**Br. Luma** 1965/6 List −5%
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
R/PS60 pear shaped clear	75 0	38 6	41 2	61 11	65 7	71 3
25–100 watt pearl	105 0	48 10	52 3	86 8	91 10	99 9
R/M55 mushroom clear	80 0	39 6	40 11	66 0	70 0	76 0
60 watt pearl	107 0	50 10	53 10	88 3	93 7	101 8

Notes: (i) The pear shaped bulb (R/PS60 pearl and clear) accounts for nearly half total bulb production.

(ii) Prices exclude transit breakage allowances and settlement discounts to Britannia, Crompton and British Luma.

The above prices paid by parents and by Philips were equivalent to standard list prices less the following rebates:

	Parents List less (%)	**Philips** List less (%)
R/PS 60 clear	48·7	45·1
pearl	53·5	50·2
R/M 55 clear	50·6	48·9
pearl	52·5	49·7

382. *Glass Tubes and Components Ltd.* (GTC). The formation of Glass Bulbs had left AEI with some glass production at Chesterfield and GEC with glass works at Wembley and Lemington-on-Tyne; both companies also had lamp metals operations at five locations remote from their respective main lamp factories. In 1959 AEI and GEC began negotiations for the integration into two additional jointly owned companies of such of their lamp components operations as were not already combined in Lamp Caps and Glass Bulbs. The negotiations resulted in the formation in 1961 of GTC, which has factories at Chesterfield and Lemington-on-Tyne, and of Lamp Metals, which has factories at Wembley and elsewhere. At Chesterfield GTC makes soda glass tubing for fluorescent lamps, lead glass tubing for flanges (or flares) including some finished flanges* and rod and exhausts for filament lamps. It also makes domestic glassware on machines which were used for lamp bulb production before the setting up of Glass Bulbs. The Lemington factory produces special bulbs, including those for mercury and sodium lamps, projector lamps, lighthouse lamps etc; it also makes glass products not connected with electric lamps.

383. Prices to the parent companies are at full cost. A standard cost is prepared for each item and deliveries to parents are invoiced on this basis; the prices are

*Most lamp manufacturers, including BLI and Osram, make their own flanges from glass rod; some, including Osram, also supply them. GTC, which draws part of its sales requirements of flanges from Osram, keeps three flange machines in use partly as a buffer against any shortages experienced by the parents, and partly to supply some of the requirements of the Controlled Companies and to supply the requirements of Maxim.

adjusted annually and corrections are back-dated. Standard price schedules with, for certain items only, quantity discounts, are drawn up for bulbs, glass tubes for fluorescent lamps and glass tubing and rod; these schedules are not published but are said to be 'available to all customers who make application for them'. GTC said that a wide variety of specifications and types of finishes exist, and the schedules provide only a general guide to prices. Costs are considerably affected by the particular tolerances required by individual customers.

384. Examples of the prices charged to parents and others in 1965/66 are as follows:

(a) **Soda glass lamp bulbs**

	Price per 1,000 *bulbs*	
	Invoiced price to parents	List price to others
	£ *s.* *d.*	£ *s.* *d.*
R.150A high wattage filament	17 14 3	44 11 6
KF46A twisted candle	8 2 0	16 2 6
X75A 75 mm discharge	10 4 6	14 10 6
T51BB discharge	17 17 6	24 0 0

(b) **Lead tubing**

Standard prices

Flare 9–15 mm 21·6 pence per lb
Exhaust 3– 5 mm 27·0 pence per lb
Rod 3– 5 mm 27·4 pence per lb

Prices are reviewed annually and discounts on tonnages above 20 tons are

20–99 tons standard price less approx 10 per cent
100–199 tons standard price less approx 12½ per cent

Actual prices charged in 1966:

	Pence per lb			
	Invoiced prices to parents *d.*	Philips *d.*	Controlled Companies *d.*	British Luma *d.*
Flare				
9–12·75 mm, diameter 0·7–1·4 mm wall standard length	12·44	20·8	17·8 (special tolerance 0·50 mm)	20·8
Exhaust				
3–4 mm, diameter 0·4–1·0 mm wall 90–120 mm length	24·05	—	36·7 (special tolerance 0·25 mm)	36·7
Rod				
3–4 mm diameter 20–29 mm length	26·00	41·1	41·1 (special tolerance 0·25 mm)	41·1

(c) **Fluorescent tubing**

	Pence per tube		
Standard prices	End trimmed	Shoulder formed	
	Osram *d.*	BLI *d.*	Others *d.*
4 ft 1½ in diameter	4·0	4·75	5·75
5 ft 1½ in diameter	5·0	6·00	7·9

Actual prices charged in 1966 for shoulder formed:

	Pence per tube	
	Invoiced prices to BLI *d.*	Prices to Viking *d.*
4 ft length	4·75	5·75
5 ft length	6·00	7·90

Sales to Viking, the only substantial outside customer for tubes, are 4·1 per cent by volume of total sales of tubes. Viking does not qualify for the quantity discount of 5 per cent on annual purchases of 1 million tubes.

(d) **Flanges**

	Price per 1,000 *flanges*							
	1966/67				**1968**			
	Parents		All others		Parents		All others	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
35·0 mm diam / 21·0 mm length	18	10	26	0	19	7	26	0
38·0 mm diam / 21·0 mm length	20	2	23	6	21	8	23	6

(The above are the only types of flanges made by GTC)

385. *Lamp Metals Ltd.* has factories at Wembley, Rugby, Corby, Ponders End and Shaw and has recently established another factory at Gateshead. The factories at Corby, Ponders End and Shaw have now been closed. Processing of the raw materials is carried out at Rugby and manufacture of wire and other components is carried out at Wembley and Gateshead. (The company does not supply coiled filaments.) About three-quarters, by value, of total sales is made to the parents, and most of the remainder is sold to the Controlled Companies and BELL.

386. The company told us that before February 1965 prices to the parents were fixed at a level which would recover total costs and that adjustments were made at the end of each accounting period. Since then, prices had been related to the prices at which the parents could purchase the items from other suppliers. In practice, the policy has resulted in the prices to parents being identical with Mullard's prices, and any losses arising therefrom have been borne by the parents. For the small sales to other customers, each inquiry is negotiated in relation to the prices and quantity discounts of other suppliers (Mullard).

387. *Costs and profits.* The trading results of the four jointly owned companies are dealt with in chapter 10.

388. *Mullard Ltd.* makes tungsten wire, molybdenum wire, copper clad wire, coiled filaments and electrodes for reference lamps at its factory at Blackburn for supply to Philips Electrical and to all the other United Kingdom lamp manufacturers. Until recently, it also supplied glass tubing and rod to Philips Electrical and other companies in the group. Mullard has said that in its supply of components for reference lamps, it does not discriminate between its customers. Prices are on a quantity discount basis with the exception of associated companies which are at an inter-company price based on manufacturing cost. Standard list prices are published for tungsten wire, molybdenum wire and copper clad wire. There is no standard price list for coiled filaments. Mullard explained that filaments, even for GLS lamps made to BS 161, are by no means standard products; the specification allows manufacturers a choice of compromises and they all call for slightly different specifications of filament performance. However, the possible variations in filament dimensions are, in practice, minimal. Electrodes are manufactured to individual customers' own specifications. The glass tubing and rod, which Mullard has now ceased to supply, was sold to Philips Electrical at inter-company prices and to Luxram at prices competitive with those offered by other suppliers.

389. Prices to individual customers are determined on the following bases:

tungsten wire

1 m.–5 m. metres per annum—list less 10 per cent
5 m.–20 m. metres per annum—list less 20 per cent
Over 20 m. metres per annum—list less 25 per cent

Exceptionally, BLI, which takes over 100 m. metres per annum, buys at specially negotiated net prices; and Crompton, whose arrangements are governed by a supply agreement dating back to 1957 when Crompton closed down its own wire production, also buys at special prices.

molybdenum wire

This wire is used only in small quantities in the lamp industry. Quantity discounts of up to 20 per cent are offered, according to quantity and specification.

copper clad wire

The standard list prices are net to all customers.

coiled filaments

Individual quotations have established a price pattern which varies only within 10 per cent over the range of customers.

electrodes

The individual specifications required preclude any standard prices or valid comparisons of prices between customers.

390. *Chance Bros. Ltd.* manufactures soda lime tubing for fluorescent lamps and lead glass tubing for flanges and exhausts at its factory at Smethwick. It does not supply finished flanges. Chance has no published price lists.

391. Pricing arrangements are as follows:

Soda lime tubing

Chance has for internal use standard price lists for the different specifications and lengths of tubing, and a scale of quantity discounts based on quantities from 250,000 to 3 m. The smaller manufacturers are supplied on this scale. Special arrangements are:

BLI takes the bulk of its supplies in end-formed tubes and has been on a special quantity scale of an additional 1 per cent per m. up to 16 m., then by ½ per cent per m. up to 19 m. In 1965/66 BLI took quantities considerably above those envisaged by the special quantity scale and were given an additional rebate of £9,000. Subsequent to April 1968 the price list to BLI has been replaced by a new one which starts at 15 m. at approximately 5 per cent below the old 19 m. prices.

Philips takes all its supplies in trimmed and glazed tubes and until 1966 was buying from Chance at the top of the discount scale applicable to the standard price list. Chance then lowered its prices to meet the competition of GTC, but later increased them again and allows Philips an additional discount for increased quantity of 2 per cent for each extra million. As from 1st January 1968 a firm annual contract was negotiated at prices with an additional 17 per cent for the 4-ft tube and 12 per cent for the 5-ft tube.

Crompton and Viking. In 1967 Chance entered into a three-year contract to supply Crompton and Viking at special net prices on the basis of a joint require-

ment. It had formerly supplied each company at standard prices less the appropriate quantity discount.

Lead glass tubing and rod

Here again, Chance has standard list prices for the usual specifications of tubing and a quantity discount scale for internal use. The prices vary slightly according to the tolerance required, but Chance said that manufacturing efficiencies are now such as to make it possible to supply the tightest tolerances at no extra cost. The smaller manufacturers are quoted at standard prices and discounts. Special arrangements are:

Philips is supplied at a discount related to its potential purchases in order to encourage it to take larger quantities.

Crompton and Viking. The arrangements for soda lime tubing apply also to lead glass tubing and rod.

CHAPTER 8

The Distributive Trade

392. The sale of reference lamps forms only a small proportion of the total trade of any category of distributors or, indeed, of any individual distributors. We have been told by the principal manufacturers that the majority of retailers of reference lamps sell less than £100 worth in a year. A survey carried out by the Electrical Wholesalers' Federation in 1964 showed that electric lamps represented about seven per cent of the total business done by its members. The turnover in reference lamps of the individual wholesalers who have supplied evidence for our inquiry varied between 2½ per cent and 9 per cent of total turnover.

Part I: Wholesalers

393. *The Electrical Wholesalers' Federation* (EWF), a registered trade union, was formed in 1914. It told us that, in common with most trade associations, its origins were of a restrictive nature and until the introduction of the Restrictive Trade Practices Act 1956 a large part of its activities were concerned with co-operating with manufacturers' associations in restrictive arrangements. Between 1951 and 1957, the EWF negotiated with ELMA on agreed trading conditions and lists of appointed wholesalers. (The scheme of payments to distributors' associations, criticised by our predecessors, had been withdrawn, see paragraph 165.) The EWF said that with the formation of ELIC in 1957 it negotiated with ELIC the Recommended Non-Mandatory Trading Structure (see paragraph 189). The jointly agreed list of wholesale distributors was then discontinued and it was left to the individual manufacturers to make their own wholesaler appointments.

394. The EWF has some 250 members, which together provide a total of more than 500 wholesale outlets in about 150 towns; it covers the great majority of electrical wholesale outlets in the country. The EWF estimates that there are, at most, no more than 50 electrical wholesalers who would qualify for membership but who are not members. The importance of wholesalers to the principal manufacturers, in particular, as distributors of their main brands of lamps, is illustrated by the figures given in paragraphs 228, 247, 269 and 301.

395. The EWF has seven area sections, each represented on the National Council. The qualifications for membership of the Federation include the fulfilment of certain conditions as to period of time in the electrical wholesaling trade, premises, stocks and minimum turnover. An applicant for membership is required to name the suppliers of goods in specified categories, which include GLS lamps and fluorescent lamps, who grant him wholesale terms. An Inspection Committee appointed by the local area section visits the applicant and forwards its report to the National Council with a recommendation of acceptance or rejection. The form of report, which we were told was originally drawn up in 1958, shows, inter alia, whether or not the applicant is recognised by each member of ELIC; 'I do not know that it is wanted now, but it still remains on the form'. The EWF told us that in 1958 it would have regarded recognition by members of ELIC as a prerequisite for membership of the Federation, but that this no longer applies. The EWF said that very few applications for membership were, in fact, rejected; the normal ground for rejection was that the applicant was not considered to be

fulfilling a genuine electrical wholesaling function and it indicated that the number of existing electrical wholesalers already in a particular district did not enter into the consideration of an application for membership.

396. In the changed circumstances since 1956, the EWF continues to discuss matters of mutual interest with manufacturers, manufacturers' associations and contractors' and retailers' associations, but it said that in its changed role it places more emphasis on constructive work. It promotes schemes for the education and training of junior staff and senior management, compiles standard installations materials and domestic appliance catalogues for use by members on a co-operative basis, it has a Standardisation Committee which examines ways of rationalising products and standardising of packaging and labelling, and it has a Computer Applications Committee which has developed an inventory commodity code for use throughout the electrical industry. It has instituted a system of inter-firm comparisons in which over 50 per cent of its members take part.

397. A group of committees, formerly known as Negotiating Committees and now renamed Commodity Committees, deal with particular electrical products or groups of products; these committees include the Lamp and Lighting Fittings Committee which represents the EWF at the periodic meetings with the General Purposes Committee of ELIC. On occasions, the Director of the EWF has had separate meetings with the Director of ELIC. A general account of some of these joint meetings and discussions is in paragraphs 189–194.

398. On 18th November 1966 representatives of the EWF attended a hearing to discuss with us some of the activities of the Federation, and some of the matters recorded in the notes of joint meetings with ELIC, including the operation of the 1960 Discount Schedule which was then being operated individually by the members of ELIC. At the time of this hearing, resale price maintenance applied to the principal manufacturers' main brands of lamps. As regards the representations made from time to time to ELIC by the EWF about terms quoted by certain members and non-members of the EWF, the Federation told us that its purpose in raising these matters at joint meetings was 'to act as an information service to the manufacturer as to whether or not the manufacturer was prepared to enforce his conditions of sale'. The EWF confirmed that the members of ELIC had undertaken, individually, to consult the Federation when considering the appointment of any wholesale distributor (see paragraph 192). It said 'This arose because they made certain appointments without any consultation whatever and then, having learnt of that, we wrote in some cases and said to them that some of these appointments were not good ones and were being made due to the enthusiasm of certain of their travellers. We suggested that to avoid these unsuitable appointments in future that they did not make any new appointments before consulting us. We have people all over the country who can give us information very quickly, and we suggested it would save these little bits of awkwardness in the future if they would ask us first before appointments were made. They said that they would ask us, but they would not necessarily take our recommendation if they did not think it was a good one.' The then Director said 'I think so far as we are able to do it within the existing legislation we do try and see that wholesale terms are given to people who are, in our opinion, capable of doing a wholesale job . . . as a trade union officer it is my job to protect my members to the fullest possible extent; but at the same time we never try to restrict somebody coming into the industry who has the capability of doing it.' The EWF explained that the different members of ELIC adopted different procedures in respect of the consultation; some, for

example, consulted the Federation only when they were in doubt about an appointment. The EWF received on average four or five inquiries a month from members of ELIC about wholesaler appointments.

399. We next raised with the EWF the subject of the proposals it had made to ELIC in 1962 and again in 1964 for changes in the 1960 Discount Schedule. As we have already mentioned in paragraphs 189 and 190, the 1962 proposals were for a simplified discount structure based on a trade (retail) discount of 25 per cent off list prices 'to be allied wherever possible to reductions in list prices' instead of the then 30 per cent; and the 1964 proposals included the 25 per cent trade discount, with a differential of at least 15 per cent for wholesalers and a scale of quantity discounts for single orders. The EWF said that the main difficulty for wholesalers had been the 'huge discount' which they had had to allow to large users and contractors, which had left them with an uneconomical profit margin. It said 'That is why we have tried to put forward a rationalisation of the scheme which appeared to give us a better percentage and at the same time make a maximum of give away that would be acceptable.' 'We said that if the discounts were to start off on the basis of 25 per cent there was something to play with, and the excessive discount can be reduced to the really big user and reduce the price of the lamp at the same time.' It had, in effect said to the manufacturers that they would be in a position to reduce their list prices if they accepted the EWF's scheme. The EWF told us that, in its view, the large users would have been no worse off under the scheme, which allowed for reduced discounts to these buyers, if the list prices had also been reduced.

400. The small margin on sales to large users and contractors was the EWF's main complaint about the operation of the 1960 Discount Schedule. Any large user might have branches near a wholesale outlet and 'therefore although they may be graded, on their total purchasing power, as entitled to very high terms, the actual volume of business between the wholesaler and that particular branch may be very small indeed but is all done on a very small margin of profit. I think this is really what we are talking about when we say a very narrow margin on big customers'.

401. In discussing wholesalers' margins generally, the EWF said that these must be sufficient for wholesalers to take a real interest in the lamp business. Lamps were not the most profitable part of an electrical wholesale business and a report made about 1964 had shown that the average margin on the main range of lamps was between 10 per cent and 15 per cent, which was below the average margin on electrical products as a whole.

402. As regards the costs of distribution under the 1960 Discount Schedule, the EWF said

> Our policy as a Federation is that one must examine the cost of distribution. As automation goes further, manufacturing content comes under economies and therefore the distribution element becomes higher. We have been discussing with all manufacturers, not only lamp manufacturers, the question that wholesalers who take large quantities should get an appropriate reward for taking the large quantities and stocking them, and wholesalers who are only prepared to buy in smaller quantities should get a disincentive to order the small quantities. We want to see a real reward for the chap who is taking large quantities and a disincentive for the chap who is not prepared to do so. Our critics may say it is an argument against the smaller wholesaler, but it is our experience that a man cannot be a good wholesaler to all manufacturers. He has to be selective in what he handles. We think this streamlining will apply not only to the lamp manufacturers but also to manufacturers of many other things.

In commenting on its system of inter-firm costings, the EWF said

> Arising out of these costings, we have made it known to manufacturers both in lamps and other things that we favour an extra discount for large drops. Everything is going towards large-scale distribution. The lamp is the worst thing we have for stocking, in terms of cost. Its low value per cubic foot of space is tremendous compared with most other things. If we have large drops from the manufacturer we have to increase that rather uneconomic space to take account of the large drops. Therefore we are fighting all the time to get some extra reward for taking large drops. We say that if we take large drops we deserve an extra discount because we have to provide extra space—and uneconomic space.

Asked whether the manufacturers had been opposed to this suggestion, the EWF said that they had said they would have to think about it 'but they keep on thinking about it and so far none of them has agreed to [the] suggestion'.

403. As we have shown (paragraph 195), the EWF was originally joined with ELIC in the application for exemption in respect of electric lamps under the Resale Prices Act 1964 but withdrew in 1966 after the preliminary hearing before the Restrictive Practices Court. Following the ending of resale price maintenance on lamps in April 1967, the introduction by BLI of a new trading structure which was adopted by the other members of ELIC, and their adoption of the practice of recommending, or in one case publishing, the list prices and discounts of their main brands, we invited the EWF on 12th April 1967 to comment on the new situation. We then learned that the EWF had already decided to address an inquiry to all its members to ascertain how they were affected by the new trading structure, and on 22nd May 1967 the Federation wrote to say that it had completed its inquiry, and although it was difficult to summarise the replies, it gave the following indication of the result:

> We asked members who wished to criticise the new trading structure to let us have:
>
> (a) an estimate of reduced profitability, if any, and
>
> (b) general comments.
>
> Of the 211 members of the Federation only 10 were actually able to produce figures on the lines we had requested, indicating reduced profitability, although some others did provide figures which we would not regard as conclusive. Six other members estimated that their margin of profit might be slightly better than previously but they were still critical of some aspects of the structure. Seven members did not feel able to complete our questionnaire but were critical of some aspects of the new trading structure. The position, therefore, is that in general the majority of members seem to feel that the new trading structure will be workable. While obviously those members who feel that the distribution of lamps is going to be less profitable have clear reasons for their criticism, it may be helpful to give you the broad grounds of that criticism. These seem to be in the main two. First, smaller members feel that the differential between the terms at which the large wholesaler and the small wholesaler can buy is much too great. Second, some members feel that the decision by the manufacturers to sell at 40 per cent off list price to all Local Authorities means that the members who have been doing business with *small* Local Authorities at terms less than this will lose this section of their business. I must emphasize that at this stage this survey is inconclusive because nobody yet knows what the pattern of lamp trading without Resale Price Maintenance will actually be.

404. *The evidence of individual wholesalers.* In 1966 we obtained evidence from twelve electrical wholesalers, eleven of whom were members of the EWF. The approximate turnover in reference lamps in 1965 of these wholesalers ranged from £2,500 to £550,000. Four operated from one address only and the number of branches operated by the other eight ranged from one to thirty-seven. Eleven handled more than one main brand and one (in Northern Ireland) handled only one main brand; a few also mentioned purchases, at higher discounts, from

Luxram and Ismay. One large wholesaler said that the services performed in return for the special rebates it received from the four principal manufacturers included purchase and stocking in bulk, which enabled it to provide a day-to-day service, and the extension of credit facilities to all categories of customers, services 'it would be impossible for the manufacturer to undertake without incurring a considerable uplift in overhead expenses'. Another large wholesaler in receipt of special rebates said that it was its normal practice to offer incentive discounts to its customers in addition to the terms laid down by its suppliers, but that these were related to total purchases and not specifically to electric lamps. A wholesaler who bought only from the principal manufacturers said 'There are others who would, no doubt, give us increased terms, but we prefer to buy from the leaders because of their reliability in the way of their product, their service and their acceptance by our customers'. The wholesaler not a member of the EWF said that it was originally classified for discount by ELMA: 'Since ELMA was disbanded we have never disclosed our turnover to ELIC or to individual manufacturers' but it had continued to receive the terms appropriate to its original classification. It said that 'having regard to the fact that, generally speaking, present day lamp prices are the same or lower than those ruling pre-war and bearing in mind that our distribution costs have risen steeply in the meantime, our profit margins have been of considerable concern to us'. As a result of persistent negotiations with one of the principal manufacturers, it had succeeded in negotiating a special rebate. Another wholesaler operating in a rural area said that at one time it had received special terms on a main brand. It was then put on the standard terms for its classification, and 'this cut our margin down to something like 10 per cent and forced us to handle brands such as Ascot and Omega which show us a reasonable coverage'. One wholesaler whose sales of reference lamps were made almost entirely to industrial users said 'these fall into various discount gradings, according to their purchasing powers . . . Many of the large industrial users can purchase just as cheaply as we can so consequently we are unable to supply them'.

405. Another wholesaler who supplies industrial users said 'Although lamp manufacturers all give the same colour definition to fluorescent lamps they do vary in shades from one maker to another'.

406. At about the same time in 1967 as we received the EWF's comments on the introduction of recommended prices and BLI's new trading arrangements (see paragraph 403), we obtained evidence on these matters from fifty-eight individual electrical wholesalers. Three of the witnesses said that they were generally disregarding the recommended prices. Fifty-five said that they were generally complying with the manufacturers' price recommendations; of these, twenty-one said that they were departing from them in some cases, mainly by allowing additional discounts to industrial and trade users. One of the twenty-one said he allowed the additional terms 'Where competition not only from distributors but especially from the manufacturers themselves creates a market more conscious of price than service and quality.' Another wholesaler said 'Under the new discount structure imposed by BLI, which reduces coverage by 5 per cent, we can no longer supply Electricity Boards or Public Authorities at the terms which they get from our national competitors. The terms which the ordinary contractor or retailer enjoys is a discount of 30 per cent, which shows us 6·4 per cent gross profit.' Another said 'I feel the new lamp terms will allow us less profit and can see we will have to put all our lamp trade through one or two suppliers. At the moment we will follow recommendations, but we would like to

discontinue top terms to Local Authorities as the recommended terms do not allow a working profit.' The general opinion amongst the wholesalers was that the recommended prices and discounts were fair and provided for a stable industry, the replacement of faulty lamps and adequate stocks at a large number of outlets. A number of the wholesalers considered that if prices were not recommended, prices would eventually rise and quality would suffer. Other points made were that lamps would be dearer in sparsely populated areas, purchase tax would be difficult to calculate and there would be administrative problems with additional costs.

407. In view of the claims made by the leading manufacturers in late 1967–early 1968 that wholesalers were now largely departing from the recommended or published prices and discounts for reference lamps, we conducted a further investigation in January and February 1968 in order to test the position. Evidence was obtained from forty-one of the wholesalers who had supplied information in 1967 and from fourteen who had not previously been approached. Of the eighteen wholesalers who had previously reported that they were following the recommendations, three reported that they were now allowing special terms in some cases; two said that 5 per cent of their business in lamps was supplied at special terms and the third that about 10 per cent was supplied at special terms 'to meet competition'. Of the fifteen wholesalers who had previously reported that they were generally following the recommendations but departing from them in some cases, three said that there had been an increase in the proportion of their trade in lamps which was done at special terms. One said 'The amount of business at special terms has been increasing a little, due to (a) competition between electrical wholesalers (b) "non-ring" manufacturers trying to get into certain (particularly large) customers and take business direct.' The second said 'We have always kept to the prices recommended by the manufacturers but are still having to give various discounts to our customers, sometimes on a quantity basis and other times to meet discounts offered by competitors. We have increased the amount of business done at special terms, but this is due mainly to the expansion of the company as a whole. I personally believe that it is much better to have a basic price which is constant and to allow discounts to reduce prices, as it is my opinion that the general public should know the basic price of any particular article, before discounts or allowances are made, thus stopping unscrupulous salesmen from giving false basic prices. This I feel applies to all products as well as lamps.' The third said 'We have increased the amount of business done at special terms because of the enormous price competition. This competition causes us to increase our discount to virtually an unprofitable point and consequently orders obtained in this manner must be dealt with separately and not from stock thus causing the service to deteriorate. This competition is caused by competing with our own suppliers for what is traditionally our market. Ultimately if the distribution of lamps by the wholesaler were to become uneconomical then the range carried in stock would be drastically cut and service would thus be curtailed and furthermore the cost of many items would inevitably have to be increased to meet the extra costs of distribution thus incurred.' Of the twelve who had not increased the amount of business done at special terms, one said 'There is no apparent increase in our business, due to retail price maintenance effect on the trade, and we doubt if there is ever likely to be, since we have already stated in our earlier report, electric lamps are being sold at prices as low as can be, and in fact our profit margins are so low that we seriously consider whether it is worth selling lamps at all.' Several wholesalers referred to the special promotion schemes operated by the principal manufacturers in the

Autumn of 1967 which we have mentioned in paragraphs 318–321. One said 'One large company offered gift incentives to our customers and discount incentives to us. Other companies only offered extra discount. However, I am pleased to inform you that this has now ceased—sanity has prevailed—and we are now back to normal trading terms from all manufacturers.' Another said 'There has been some difference in the terms at which we buy lamps, as for the three monthly period up until 31st January, manufacturers were either giving away free gifts, green stamps or larger discounts to try and capture the whole of the retail lamp business. As this did not work, and the sales were not increased appreciably, they have all now decided to go back to the ordinary discount structure, that was in operation before last September.' Another said 'The main changes have been in connection with sundry promotional offers by all manufacturers, offering generally for a limited period additional discounts of 8½ per cent GLS and 12½ per cent on tubes.' Of the three wholesalers who previously reported that they were generally disregarding the recommended prices, one said that 80 per cent of his lamp business was done at special terms. He went on to refer to the extra discount given under the special promotions and added 'This appears to have been given so as to deliberately encourage the wholesalers not to follow the recommended discounts. These [special] discounts have now been suspended as from February 1st and all manufacturers have reverted to their fixed discounts as prior to May 25th 1967. During the last four months the electrical lamp trade has been very competitive and energetic. The main advantages have gone to the industrial users and the lamp retailers.' The second said about 30 per cent of his lamp business was done at special terms; 'We would like to point out that if this proportion rose we would think seriously whether it was an economic proposition to carry a wide range of lamps for the capital outlay involved.' The third said that about 25 per cent of his lamp business was done at special terms.

408. Of the fourteen new witnesses approached, three were not generally following the recommended prices, four were following them and seven sometimes allowed special terms. On the subject of special promotions, one wholesaler said that while the manufacturers talked of 'sales promotion schemes' he regarded the position as more one of 'price warfare'. Another said 'We feel that some of the free gift schemes run by certain manufacturers should be stopped and the retail price correspondingly reduced.'

409. To sum up, the result of the inquiries made in January and February 1968 was that of the fifty-one wholesalers who supplied information, twenty-two were following the recommended prices, twenty-five were departing from them in some cases and four said they were not following them. Apart from the matter of the special promotions in the Autumn of 1967, there was some indication in the replies received of increased competition for user business, both between the wholesalers and between wholesalers and the manufacturers.

410. Philips introduced its new discount structure on 1st March 1968. We made no inquiries of the wholesalers about their reactions to these new arrangements and to the subsequent changes made by the other principal manufacturers as we considered that insufficient time had elapsed, and that the wholesalers could not reasonably be expected to comment.

Part II: Retailers

Retail trade associations

411. The main retail trade associations whose members are concerned with the sale of reference lamps are The National Federation of Ironmongers (NFI), a

registered trade union, The Radio and Television Retailers' Association (RTRA) Ltd. and The NECTA Ltd. (National Electrical Contractors' Trading Association).

412. *The NFI* has about 6,000 members who are retail ironmongers and hardware dealers; most of these sell electric lamps. The NFI told us that it had had no general negotiations with lamp manufacturers in the past ten years or so except that, after failing to interest the principal manufacturers in the matter, it had negotiated with a second brand company for the provision of cheap lamps to members, to compete with the lamps sold in chain stores. The lamps are marketed by the members under the brand name 'Spacelite', registered by the NFI. Members obtain the lamps direct from the manufacturer at prices and terms negotiated by the members, individually. The NFI estimated that about one-sixth of its members sold 'Spacelite' lamps. Many of them also sold the principal manufacturers' main brands, and some sold second brands. The NFI told us in April 1967 that it had had no complaints from its members following the abandonment of resale price maintenance on lamps, the introduction of recommended prices and the changes in the principal manufacturers' discount structures. 'While it is early days, of course, I think it is generally realised that the lamp industry is falling into line with current trends in distribution. The new arrangements may well give the manufacturer a greater degree of flexibility which will, on the whole, be an advantage.'

413. *The RTRA* has about 3,400 members accounting for some 5,600 retail outlets. (Some of the members are also members of the NFI and the NECTA.) The majority of members are thought to stock electric lamps but, we were told, mainly in order to provide a service to customers for the main products handled and to attract them into the shop. The RTRA told us that it had had no discussions with lamp manufacturers or association of lamp manufacturers. The only comment it had on the abandonment of resale price maintenance on lamps, the introduction of recommended prices, and the changes in the principal manufacturers' discount structures, was that the manufacturers' insistence on minimum orders of twenty-five lamps might operate against the smaller retailer; the association suggested that a minimum order of 12 lamps would be a more reasonable minimum for its members.

414. *The NECTA*, with its associated associations, The Electrical Contractors' Association (Inc.) Ltd. and the National Federated Electrical Association, covers all aspects of the electrical contracting and retailing industries. The NECTA has about 2,600 members. It told us that meetings to discuss lamps with other sections of the electrical industry are infrequent. Since ELIC was formed in 1957, the two associations have met on five occasions. The discussions related mainly to the ELIC trading structure, sales to users, and technical matters. Joint meetings between the NECTA and the EWF are held at approximately yearly intervals; occasionally, lamps are discussed, mainly in relation to sales to users. On 24th May 1965 a meeting was held at the NECTA's request between it, ELIC and the EWF. The notes of the meeting record that the NECTA had asked for the meeting with the lamp manufacturers as it considered that the general trading structure for lamps was no longer satisfactory. The NECTA felt that the manufacturers were spending a great deal on distribution (which it considered was not their function) whereas contractors and retailers were spending very little because it was not worth their while to distribute lamps or look for business. The more profitable lamp business was not available to them because of the high discounts allowed to users. The representatives of ELIC agreed that the manufacturers

were undoubtedly undertaking more distribution than was strictly necessary, not on account of the number of customers supplied but because of the small size of orders which did not justify the distribution costs. The manufacturers, themselves, were not satisfied with the current discount structure and especially with the terms to users which had been forced on them by internal competition and the threat of imports. Stability was essential if the industry was to progress, although to achieve it some buyers would inevitably be hurt. The manufacturers indicated that they would like to do something to improve the current distribution system and that they would 'do their best, in fullest consultation with other sections of the industry'.

415. The NECTA had no comment to make in May 1967 on the abandonment of resale price maintenance on lamps, the introduction of recommended prices and the changes in the discount structures of the principal manufacturers.

The evidence of individual retailers

416. As well as seeking information from associations of retailers, we obtained information in 1966 from a number of individual retailers, including chain stores, electricity boards, electrical retailers and contractors, radio and television retailers and ironmongers.

417. *Woolworth*, which sells lamps in all its 1,126 stores in the United Kingdom, is by far the largest retailer of filament lamps; its sales in 1965 representing about 14 per cent, by number, of total sales of filament lamps in this country. It obtains part of its requirements from its traditional supplier, Britannia (one of the Controlled Companies), under the brand name Sunshine, and part from BLI, under the brand name Vesta. A short account of the Controlled Companies' sales to Woolworth is in chapter 6; and short accounts of Thorn's, and (later) BLI's, sales to Woolworth are in appendix 1 and paragraph 232, respectively. Over 80 per cent of Woolworth's sales of reference lamps are of single-coil GLS types in the 15–200 watt range; it also sells other types of filament lamps, including mushroom lamps, candle lamps and coloured lamps. It sells relatively small quantities of fluorescent lamps, as a combined lamp and fittings pack which it obtains from an independent fittings manufacturer. Woolworth guarantees the GLS lamps for 1,000 hours and replaces failures free of charge. It sells only a small quantity of 250-volt lamps and said that it has no knowledge of any demand for long life filament lamps.

418. The net prices paid by Woolworth to Britannia and BLI are the same, type for type; the quantities obtained from each are not, however, equal. The retail prices are fixed by Woolworth and are in all cases lower than the list prices of the corresponding main brands of lamps. For example, the retail price (inclusive of tax) of 25–60-watt Sunshine and Vesta lamps is 1s. 5d., and of the 100-watt lamps is 1s. 9d., compared with 1s. 11d. for main brands of these wattages. From time to time, when Woolworth has special sales promotions, lamps are included in the price reductions; 25–60-watt lamps are reduced to 1s. 1d. and 100–watt lamps to 1s. 4d. Woolworth told us that it considered that the lamps industry was 'most efficient and well organised'.

419. *Other chain stores*, seven in number, which supplied information were all selling filament lamps, obtained direct from the principal manufacturers' second brand companies or from the Controlled Companies, at prices which were

generally the same as those charged by Woolworth. Two were selling the lamps under their own brand names. Five considered conditions in the industry to be competitive or reasonably competitive. Three commented favourably on quality and service.

420. *Electricity boards* are increasingly selling electrical products, including lamps, under their own brand names. One board, with 138 selling outlets, told us that it had started to sell lamps under its own brand name to accord with its practice as regards other domestic appliances, and in order to offer lamps, to which no resale price conditions attached,* at prices competitive with those sold in chain stores. It said that the influence on public demand of the old established brands had lessened in recent years. Apart from the lamps obtained for resale at lower prices, the remainder of resale requirements were obtained from 'ELIC members at list prices subject to the standard discounts and quantity terms set out in their Discount Structure for Electricity Authorities'. Another board, with seventy-five selling outlets, said that it had 'no reason to believe that an official invitation to tender for a contract would produce other than identical terms from ELIC members' and it could not, therefore, be said that the industry was fully competitive. It was reasonably satisfied as regards service, quality and standardisation. Another board indicated that as members of ELIC quoted prices and discounts on the same basis, competition was limited to competitive tenders from other suppliers; it considered, however, that there was more competition than in the 1950's. A board with 105 retail outlets regarded the supply of lamps to sell at lower prices as fully competitive. As regards main brands, it did not find the present arrangments to be fully competitive and advantageous. The fifth board approached, which has ninety-six retail outlets, told us that when in 1965 it decided to market GLS lamps under its own brand name, an inquiry was sent to all ELIC and some selected non-ELIC manufacturers; the ELIC members either did not tender for a board brand lamp or quoted their standard discounts for their own brands. It eventually obtained supplies of its own brand from a non-ELIC manufacturer. It told us in 1966 that ELIC lamps were a good selling line owing to the demand created by national advertising and that in some cases local authorities specified the make of lamp to be used. 'Within ELIC there is virtually no competition at all as all members supply at a common list price and the discount allowed is identical.' However, in 1968 this board's opinion of the value of nationally advertised lamps appeared to have changed as it told us that its sales in 1967 of its own cheap brand had greatly exceeded the total of its sales of all other brands; 'This may be an indication that the public are not so concerned these days with buying a nationally advertised lamp if they are able to buy a similar quality lamp at a lower price from an Electricity Board.'

421. *Other retailers.* We obtained information in 1966 from 23 other types of retailers—specialist electrical retailers and contractors, ironmongers and department stores. Main brands handled were generally obtained from wholesalers and the minority who stocked second brands mostly bought direct from the manufacturers. Several of the retailers commented favourably on the quality of the lamps and the service provided by the wholesalers and manufacturers. One contractor said that quality varied not so much between brands as between different deliveries of the same brand. Another contractor said that mass production methods should lead to lower prices, especially for fluorescent lamps. A number

*This observation was made before the ending of resale price maintenance on lamps.

of the retailers indicated that few customers specified a brand but usually asked for lamps by wattage, type or shape.

422. In 1967 a total of 556 retailers, comprising 248 radio and television retailers, 166 electrical contractors, 117 ironmongers and twenty-five grocery and other chains, responded to our inquiry for information following the abandonment of resale price maintenance on lamps, the introduction by the principal manufacturers of recommended prices and changes in discounts on main brands of lamps. Only 16 of this total said they were not following the recommended prices; most of these were basing their prices on 'quantities purchased' or 'competition'. Whilst the majority were generally following the recommended prices, a number were allowing special terms for quantities to trade and industrial users, schools, hotels etc.

423. Individual comments of the *radio and television retailers* included the following:

(i) Recommended prices are 'easier for book-keeping and save time in handling since staff know exactly what price to charge'.

(ii) 'The advantage to the distributor [of recommended prices] is that a satisfactory but small profit is made on lamps. There is no advantage to the public. The price of lamps is far too high, namely, because of price rings agreed between major manufacturers. Prices should be reduced by the makers at least 15 per cent. This is one of the biggest monopolies in the country.'

(iii) 'Price margins are so small and breakages and faulty lamps are so rarely replaced by wholesalers we consider it hardly worth selling these products. If lamps were sold cheaper we would discontinue to sell them.'

(iv) 'Whilst prices are recommended, the public has a yardstick to gauge whether they are being over-charged.'

(v) If prices were not recommended the 'total effect would be marginal, bearing in mind lamps can easily be made to last a pre-determined life obviously tempting to reduce the price and the life of lamp'.

(vi) 'In my opinion, and in the opinion of the general public, the average life of electric light bulbs is not very long, and should be the subject of some investigation.'

(vii) 'Today the quality (of lamps) is shocking and two or three have to be bought instead of one.'

424. Individual comments of the *electrical contractors* included the following:

(i) 'The advantage to the retailer [of recommended prices] is that standard pricing of lamps minimises the checking of invoices and individual pricing of items. Standardisation of price is definitely advantageous from the administrative angle. We consider that recommended prices do allow a margin of profit to the electrical contractor which enables him to stock a fair proportion of the very comprehensive range of lamps offered by the manufacturers. The profit margin must also allow for a type of salesman who can advise customers from his very considerable product knowledge. The above remarks are concerned mainly with metal filament lamps. Fluorescent lamps are more difficult to retail. Owing to their physical dimensions, they require considerable space for stocking. The customer, unless he has a vehicle handy, does not want to carry them by hand very far. Customers

generally do not like fitting fluorescent lamps; even if they do the lamp may not be the cause of the light failure, it could be starter or capacitor at fault. Thus the customer normally calls in the contractor. We consider that if a free for all, low discount state is brought about in the retailing of electric lamps . . . then the public will suffer the loss of the specialised salesman which could prove expensive sooner or later.'

(ii) Were prices not recommended, some contractors thought 'Sales of lamps would go to the super-markets with no qualified staff to make certain of voltage and safety'.
'The large stores would make use of low price lamps as bait.'
'Lamp efficiency would disappear in favour of cheap filaments, giving impression of same light output and no mention of running costs.'
'Quality would be sacrificed in an effort to make a cut price lamp, which invariably would be less efficient.'
Although following recommended prices, one contractor considered it 'should result in cheaper prices should the recommended prices be discontinued'.

(iii) Some contractors who were following recommended prices considered the practice an advantage to the public but not to distributors. One commented that the 'main disadvantage to distributors is that a recommended price is in effect the maximum price he can fix. He may wish to have a bigger margin of profit. Conversely this is the main advantage to the public. The disadvantage to the public will occur if the recommended price comes to be treated as a starting figure from which he expects a discount. Then we shall have "double pricing"—with all its evils for the less well informed. Retail prices would tend to rise; the present profit margins on all electrical goods are smaller than on any comparable merchandise.'

425. Individual comments of the *ironmongers* included the following:

(i) Recommended prices eliminated 'the need (and cost) of each and every distributor wasting time and manpower working out the selling price for each and every article, which is nationally inefficient. By holding costs down it tends to hold prices down, provided there is competition amongst manufacturers as there is.'
'Recommended prices are necessary as a guide to the general public, more so with lamps where there are such a variety of types and wattages.'
'Retailers cannot overcharge for lamps when you have a recommended price.'

(ii) If prices were not recommended, some ironmongers considered:
There would be 'higher prices in scattered areas'.
'Inferior lamps would replace better quality lamps in order that the seller may maintain his margins.'
'The market would be flooded with cheap, unreliable and uneconomic consumption makes, probably foreign.'
'Price cutting would follow probably making it uneconomical for the smaller retailer to stock and sell lamps and leaving the market open to monopoly by the larger buyer, i.e. Electricity Board.'

426. Individual comments of the *grocery and other chains* included the following:

(i) Two grocery chains selling second brands considered that prices would drop if not recommended. One of the two said 'This make of bulbs is well under

the retail price of its competitors therefore giving the customer the benefit of a cheaper price. The prices would most certainly come down to at least the retail price of this make'.

(ii) Other opinions were:

'Free bargaining would soon establish a reasonable and stable structure.'
'It would not generally be an advantage to either public or trade if retail prices on lamps were not recommended. We believe, however, that it would be a considerable advantage to both trade and public if discounts were not recommended, and we believe that adherence to a recommended scale of discounts could be a serious obstacle to increased efficiency in the lamp industry. A distributor can genuinely contribute towards reducing a manufacturer's cost in a number of ways: e.g. by building up a large turnover in lamps, taking bulk deliveries to a limited number of distribution points, by accepting consolidated invoices, etc. If a recommended scale of discounts is observed by a manufacturer a distributor may be unable to benefit from the savings for which he is responsible and would in turn be unable to pass these savings on to the general public.'

(iii) If prices were not recommended research would be eliminated with 'a consequent deterioration in quality'.

427. Following the claims by the principal manufacturers at the end of 1967 and the early part of 1968 that wholesalers were largely departing from the recommended prices and discounts, we obtained further information in January and February 1968 from ninety-one retailers, including a number of those who had supplied information in 1966. Several referred to the extra discounts offered by the manufacturers in connection with the special sales promotions. Only a few reported slightly higher discounts allowed by wholesalers. The majority (71) of the retailers were following the recommended retail list prices. Of the remaining twenty, eighteen indicated that they were varying the prices in some cases for quantities, one said that he had never followed the recommended prices and the other said 'We are now selling at slightly below recommended prices' in order to 'bring our selling prices into line with our own regulation prices'.

428. We took the opportunity of asking these retailers about their sales of 250-volt GLS lamps. The reasons given by the retailers who replied to these inquiries for their sales of 250-volt lamps, with the proportion of those lamps sold to total sales of GLS lamps and the locations, were as follows:

(i) Sells to 'all customers so that lamps last longer'. 100 per cent. Bourton-on-the-Water.

(ii) 'Domestic consumers' complaints of short life from 240 volts.' 100 per cent. Huddersfield.

(iii) 'To obviate fluctuation in mains voltage.' 99 per cent. Harrow.

(iv) 'To domestic and commercial customers as the lamp gives longer life than standard volts.' 95 per cent. Clacton.

(v) 'Farmers require these because they have their own transformers close to the farms and the voltages are higher. In fact, they last longer.' 95 per cent. Pwllheli.

(vi) 'All types [of customers] but mostly for licensed premises that are in use during evening when voltage could be up.' 85 per cent. Wolverhampton.

(vii) 'These are both for domestic and industrial customers, especially where premises are adjacent to transformers and it is found that their voltage is on the high side, that is 245 volt.' 75 per cent. Wolverhampton.

(viii) 'All types [of customers]. Because of voltage surge, they feel these give longer life.' 10 per cent. Redhill.

(ix) Sells to farmers. 'Lamps used in poultry houses are on all night, apparently it is thought that the grid voltage increases at night.' 10 per cent. Andover.

(x) 'To cater for mains variations.' 5 per cent. Stockport.

(xi) 'Lamps in continual use during off peak periods when voltage rises above 240.' 1 per cent. Swindon.

429. The retailers were also asked whether they had had any demands from customers for long life GLS lamps. Very few answered, and those who did indicated that they did not know of the existence of such lamps.

430. In so far as some of the comments of the distributors in this chapter may be critical of certain practices or arrangements of the manufacturers, they have been brought to the attention of BLI, as the leading manufacturer, where relevant to such of its arrangements as were common to it and the other members of ELIC.

CHAPTER 9

Observations of Users

431. As we have shown in earlier sections, domestic users of reference lamps and the small industrial and commercial users can obtain the popular types of GLS and other filament lamps and fluorescent lamps from a variety of retail outlets which include electrical retailers, ironmongers, supermarkets, electricity boards, chain stores, department stores and the like. A comprehensive range of the various types of filament and fluorescent lamps will, however, generally be stocked only by retail outlets specialising in electrical equipment and fittings. Industrial and commercial users requiring lamps in quantity, or the more specialised types of filament and fluorescent lamps and sodium and mercury discharge lamps, generally obtain their requirements from wholesalers, electrical contractors or direct from the manufacturers. As a possible means of obtaining the views of domestic users, we asked the Consumer Council if it had any evidence or observations it wished to put before us; however, the Council told us that it had no comments to make. In 1966, when resale price maintenance still applied to the principal manufacturers' main brands of lamps, and when they were all operating, individually, the same discount schedule and their standard discounts and list prices were the same, we received information and observations from a number of users, including the Ministry of Technology, nationalised industries, local authorities, other public bodies and industrial and commercial users. The evidence and comments received are summarised in the following paragraphs. In so far as some of the comments may be critical of certain practices or arrangements of the manufacturers, they have been brought to the attention of BLI the principal supplier, whose replies to some of them are in chapter 11.

Ministry of Technology

432. The Ministry of Technology, which in 1966 took over from the Ministry of Aviation the responsibility for placing contracts for the supply of electric lamps on behalf of a large number of government departments, invites tenders on the basis of annual estimated requirements (about £½ million in 1966) from manufacturers who are included in a trade list compiled by the Ministry. We were told that manufacturers, both ELIC and non-ELIC, are selected for inclusion in the list by reason of their technical ability, manufacturing capacity and financial standing. Lamps are required to conform to the latest BSI specifications where these exist. Some lamps are made to Departmental specifications. From time to time life tests on lamps are carried out by the Electrical Inspection Directorate, a division of the Ministry of Technology. The various government departments which are able to order against the Ministry's contracts consult the Ministry about where their particular requirements are available and place their orders direct with the manufacturers.

433. The Ministry said it was confident that the quantities represented by the aggregated estimated requirements encouraged tenders at lower prices than would otherwise be the case and that competition for the contracts is sufficient to ensure that keen and genuinely competitive quotations are received. The prices quoted were those at which tenderers hoped to receive orders, and were not related to trade or list prices. In each case, the lowest tender was accepted subject to considerations such as past performance, technical suitability and manufacturing capacity.

ever, also had to be paid to the Government's requirement that special
on should be given to placing a certain proportion of contracts with
who were manufacturing in development areas, provided the total
price was not increased. Suppliers were considered generally to be co-
e and technically efficient when liaison on technical development, testing,
ved to be necessary. Although the Ministry considered standardisation of
amps to be satisfactory, it said 'there may be room for improvement in
d to candle lamps (dimensions and voltage ranges) and pygmy lamps
tage ranges). It is possible that the industry has gone too far in standardisa-
n of bulb sizes (e.g. the 60 mm. 100-watt bulb may present a fire hazard, par-
ularly on the older fittings)'. Quality was said to be generally good 'but there
s some room for improvement in meeting delivery promises'.

Nationalised industries

434. *National Coal Board* (NCB). The NCB, whose purchases of reference lamps in 1966 amounted to about £100,000, started to buy under contract in 1958 when purchasing was raised from area to national level. It said that 'when we took over the central contracting, we made it plain to everyone that we were out for competitive prices and that anyone who did not quote competitive prices would be unpopular and would have to accept the consequences of that line of action'. Tenders for estimated requirements of the various types of lamps were invited from selected suppliers who were considered to be technically and com-
ially satisfactory, and the NCB said that all its purchases were 'heavily
technical and safety aspects of the industry'. Orders were placed
allocated on a price and quality basis.
the basis of
arrangements
Wales
which were
country'. The NCB
quality of fluorescent lamps
makers, but said that the smaller manufac-
and it was therefore 'very difficult to assess the
duct'.

436. An analysis of purchases made in the first six months of national contracting had shown that about 400 different varieties of lamps were purchased. It was found possible to reduce the number to about fifty-five. In 1960 the NCB decided, with the objective of reducing the cost of electricians' time in changing lamps, to attempt the development of single-coil filament lamps having a longer life than 1,000 hours and a reduction (some reduction being inevitable in the case of longer life) in light output below that of the 1,000-hour single-coil lamp which would be imperceptible to the ordinary human eye. Development work in accordance with these limited requirements was undertaken by 'a willing manufacturer', Crompton, and trials were carried out in two NCB Divisions. The NCB said that the trials were successful and the lamps were adopted for use in all Divisions. The first specification, NCB 241/62, was for a lamp having a life of 1,500 hours and over, with a light reduction of rather less than 5 per cent. The specification was revised to NCB 241/64 to provide for a life of 2,000 hours with a light reduction of about 7½ per cent. Further experiments showed that the life in the lower

110–120 volt range could be advanced to 3,000 hours for some wattages with only a small further light reduction.

437. The NCB told us that NCB 241/64 requires much tighter tolerances than the IEC 64A 2,500-hour specification (see paragraph 3) and that the NCB also requires the lamps to satisfy its strict test conditions. The filament used for the lamps is slightly longer and slightly thicker than for 1,000-hour lamps. As regards the thickness, it said 'Considerable experiments have to be carried out to find the exact figure. There is a law which relates light output to life, but it is theoretical. It is [by] the results of practical tests that the right thickness is arrived at; those are what count'. The NCB said that the light maintenance of the long life lamps throughout their life was better than the light maintenance of the standard 1,000-hour lamps throughout their life. The lamps were said to be no more difficult to make than standard 1,000-hour lamps and, apart from the filaments, were made of the same materials on the same machines. (Crompton's production of the lamps is dealt with in chapter 5.)

438. When the NCB first supplied [illegible] life filament lamps [illegible] contract period, all manufacturers invited to tender for lamps had been invited to quote for any or all of the types of long life lamps made to the Board's specification. The Board had insisted, however, on testing samples before entering into any commitment. It told us that, originally, all the major manufacturers had been opposed to making long life lamps to its specification, and that some of them had suggested that the Board should take 2,500-hour lamps made to the IEC 64A specification. This specification permits a light output of 13 per cent below that of standard 1,000-hour lamps. The NCB told us that a reduction of anything over 12 per cent was perceptible and that it would not, therefore, accept lamps made to IEC 64A, and it indicated that the use of such lamps might have laid it open to the risk of a charge of lowering lighting levels in mines. The NCB told us recently that while Philips had shown interest in the supply of the NCB long life lamps in 1967, and had submitted samples, several other manufacturers were now willing to quote for the lamps.

440. The NCB has now ceased to buy any 1,000-hour filament lamps and has standardised throughout its establishments, above and below ground, on 2,000-hour lamps in the 230-, 240-, 250-volt range, and on 3,000-hour lamps in the 110-, 120-volt range. The NCB has described the resultant savings on purchases for the current year as 'significant'. Prices paid for the lamps are similar to those quoted for standard 1,000-hour lamps except for the higher wattages, which cost more.

441. *British Railways Board* (BR) buys lamps centrally for all five regions and British Transport Hotels Ltd. Open invitations to tender are issued and contracts are placed for twelve months and thereafter extended until further notice, subject to three months termination by either party. Contracts are awarded to the most competitive suppliers, subject to past experience of quality and service. 'In the field of general service tungsten lamps practically all supplies are taken from non-association firms, from whom more competitive prices are obtained.' BR found the present supply arrangements satisfactory 'so long as non-association firms continue to have the available capacity and quote independently and competitively'. BR told us that until recently quotations received from the members of ELIC for all descriptions of lamps were identical or virtually identical, but that the quotations received from these manufacturers for a new fluorescent lamp contract show 'very keen competitive prices' and a considerable overall reduction on the current contract with a non-ELIC supplier.

442. Vibration and shock were two aspects of wear which were under constant consideration by BR and for filament lamps BR specified the single-coil type, which the technical staff found withstood vibration better than coiled-coil. BR has no laboratory testing facilities and prefers to rely on field tests of which comprehensive records are kept. Some regions had found it convenient to have testing of GLS lamps carried out by Glasgow Corporation, which has the necessary facilities. BR found the suppliers 'always willing to co-operate in investigating troubles with their products, although their chief aim often seems to be to prove that the trouble was not due to any defect in the lamp itself'.

443. When BR supplied the above information in June 1966 it told us that it was conducting an inquiry into the use of long life lamps with the intention of using them to replace 1,000-hour lamps up to 150 watts, and that invitations to tender for lamps to the NCB specification for 1966/67 had been issued but no decision had been taken to conclude a contract. BR said that the tenders showed that there was keen competition between the manufacturers. Our subsequent examination of the tenders showed that competitive tenders had been received from Crompton, Philips, Cryselco, Luxram, Kingston, Kingston's selling subsidiary Insular, and Ismay. Philips had required a minimum order of 25,000 lamps per rating; it had quoted the same prices for the long life lamps as for standard 1,000-hour lamps. AEI L & L and Atlas each said it was unable to supply to the NCB specification and tendered for 1,000-hour lamps. Omega quoted for both its own Pluslife lamp (see paragraph 221) and the NCB lamp. Osram asked to be excused from quoting as it could not offer lamps to the NCB specification. Crompton was subsequently awarded a contract to supply the long life lamps to one region and British Transport Hotels, and Kingston was awarded a contract for supply to another region.

444. BR told us on 3rd May 1968 that 'it is now abundantly clear that the introduction of lamps to the NCB specification has cut down the number of lamps requiring replacing. As a typical illustration over seven periods in British Transport Hotels, a reduction of over 30 per cent replacement was shown in a total of 70,000 lamps'. BR told us recently that its intention is to revise the current contracts for the NCB long life lamps and to extend them to cater for all five regions and British Transport Hotels.

445. *London Transport Board* (LTB) invites tenders from approved suppliers. It told us in July 1966 that hitherto it had required GLS lamps to be made to its own specification, which was based largely on BS 161 but also incorporated the

special fusing required for certain applications. However, it had been recognised that since these requirements were not essential for all applications, some economy might be secured by purchasing standard products, including some from non-ELIC suppliers, for most purposes.

446. All lamps delivered to the LTB's depot were inspected, by sample, and this system had been found to be justified not only by the extent to which faulty deliveries were detected but to a larger extent by its 'deterrent' effect, which had a beneficial result on the quality of lamps received. Manufacturers' representatives were aware of the LTB's technical expertise and as a result it had ready access to their technical staffs. In addition, several members of the LTB's staff sat on BSI Committees and this had provided an alternative approach to the technical staffs of manufacturers (and also other users).

447. The LTB said that the supply of lamps from ELIC manufacturers, with whom the bulk of the reference lamp business was placed, was not competitive. 'While the Board would welcome competitive trading in the placing of their contracts for general lighting service lamps, the prices under present arrangements have remained relatively stable.' Prices were quoted at list less discounts. With the exception of special signal lamps, in which one member of ELIC specialised, the discounts quoted by the members of ELIC for GLS lamps and fluorescent lamps were identical. The LTB said that it had only to a very small extent been able to place business with non-ELIC manufacturers 'due to their relatively lower standard of product which outweighs any price advantage'. The main property in which the ELIC lamps were generally superior to lamps from the majority of non-ELIC suppliers was life; the former comfortably exceeded the minimum requirement of the BSI specification.

448. The LTB told us that it was well aware of the advantages of using long life filament lamps in situations where lamp changing was costly or difficult, and also of adopting a system of group replacement in such situations. In general, it had met the need by changing to fluorescent lamps, although in certain instances it had under-run standard filament lamps e.g. by using 250-volt lamps on 200-volt circuits. It did not, at that time, consider that special long life lamps were required, but if the number of the voltage ratings of lamps were reduced to one (240 volts), in line with the revision of BS 161, under-running would not be possible and there would be a stronger case for the introduction of long life lamps.

449. The LTB told us on 27th May 1968 that there had been no change in competitive conditions since July 1966, and that no amendment was therefore necessary to its comments on this subject included in paragraph 447. It also said that, while under-running of lamps used to be the practice to a very limited extent in the past, no deliberate under-running was carried out at the present time.

Local Authorities

450. As is shown in appendix 8, table 6, the ELIC 1960 Discount Schedule divided local authorities into three classifications, A, B and C. Class A covered all Rural District Councils and Parish Councils in England and Wales, all District Councils in Scotland and all Rural District Councils in Northern Ireland. Class B covered the following:

England and Wales

County Councils of under 300,000 population.
Borough Councils of under 100,000 population.

Urban District Councils of under 100,000 population.
Development Corporations.

Scotland

County Councils under 300,000 population.
All Burghs.
Development Corporations.

Northern Ireland

County Councils.
Boroughs.
All Urban District Councils.

Class C covered the following:

England and Wales

County Boroughs.
Metropolitan Boroughs.
County Councils of over 300,000 population.
Borough Councils of over 100,000 population.
Urban District Councils of over 100,000 population.

Scotland

Counties of Cities.
County Councils of over 300,000 population.

Northern Ireland

County Boroughs.

The standard discounts allowed by the members of ELIC, individually, between 1960 and April 1967 to local authorities for filament lamps and fluorescent lamps were 20 per cent off list prices to Class A; 27½ per cent to Class B; and 37½ per cent to Class C. (Lower rates applied to less than standard consignment quantities, for example less than twenty-five identical GLS lamps.) The discount allowed to all Classes for sodium and mercury discharge lamps was 12½ per cent off the trade prices.

451. In 1966 we received information and observations from twenty-four local authorities, six in Class B and eighteen in Class C. Lamps for street lighting, which include the higher wattage filament lamps, fluorescent lamps and sodium and mercury discharge lamps, normally form the bulk of local authorities' lamp requirements, by value. Class A local authorities are very small purchasers of lamps for street lighting and, although we obtained information from a few of them, they are not included in the total of twenty-four witnesses mentioned.

452. We found no uniformity in the purchasing arrangements for reference lamps reported by the twenty-four local authorities; thirteen invited tenders by public advertisement, eight invited tenders from selected suppliers and the remainder appeared not to enter into any formal contracts for lamps. Some bought only from manufacturers, some from both manufacturers and wholesalers and some only from wholesalers. The majority bought at least some of their requirements from wholesalers and a number referred to the advantages of obtaining different types and brands of lamps quickly and in small quantities. None reported purchases of non-ELIC lamps from wholesalers. Total annual purchases of reference lamps in 1965 by the six Class B authorities ranged from £700 to £2,400 and by the eighteen Class C authorities ranged from £1,200 to £82,900. The absence of any advantages of bulk buying in the terms allowed by the members of ELIC

mentioned by one local authority, in particular, is illustrated by these figures of the range of annual purchases.

453. We learned from the Board of Trade that a number of local authorities had written to the Office of the Registrar of Restrictive Trading Agreements (ORRTA) on various dates between 1957 and 1965 about the supply of electric lamps. ORRTA, at our request, sought the consent of the local authorities concerned to the disclosure to us of their names. This consent was, in every case, given and the list provided covered 18 authorities in Classes B and C. These authorities were amongst those to whom we addressed our inquiries and thirteen of them supplied us with copies of their correspondence with ORRTA. We found that, without exception, the main subject of the correspondence of the eighteen authorities with ORRTA was the level tendering by the principal manufacturers for lamps of various descriptions. In the majority of cases, the correspondence had originated with the local authority and was in the nature of a complaint. In a few cases, information about level tendering for lamps was either invited by ORRTA, which had already been in touch with the authority on other matters, or was offered as a result of consultations between ORRTA and associations of local authorities. Examination of the copies of tenders supplied to us by certain of the authorities concerned confirmed that tenders by the members of ELIC were identical or substantially identical and that competitive terms had been quoted by non-members, including subsidiaries of members of ELIC and the Controlled Companies.

454. The element of criticism of conditions of supply of reference lamps was larger in the evidence of the local authorities than in the evidence obtained from any other category of buyer. Some of the observations were conflicting, particularly as regards the degree of competition in GLS and fluorescent lamps and also as regards the quality of non-ELIC lamps, but the majority referred to the common prices and terms for discharge lamps which are made only by the four principal manufacturers (see paragraph 199) and are marketed only under main brand names. Observations received in 1966 included the following:

(i) One buying officer said he was so annoyed by the fact that matters went on much as before after ELMA was disbanded that he ceased to buy GLS lamps from members of ELIC and now bought these types from 'non-ring suppliers', who offered larger discounts. Discharge lamps were bought from ELIC members but the price for these lamps was 'the same, no matter who supplies'. 'The level of prices is high especially when one considers the discount at one time available and the revised discount applying now for some years. Also the non-ring firms appear to be able to offer a similar article at a cheaper price and also give the same life guarantee for tungsten lamps.'

(ii) 'There is clearly some organisation among some suppliers which results in standard prices' and 'the present arrangements in the industry are very similar to those which were in being in 1950'.

(iii) An authority which had been buying on open tender said 'the policy has been to buy the lowest priced lamps (usually non-ring) from firms that are known to give a good service'.

(iv) One authority said that, as far as filament lamps were concerned, the present arrangements appeared to be fully competitive. The position with discharge lamps was rather different as these types were made by three manufacturers only. The prices quoted by these manufacturers

tended to be the same but their wholesalers did submit prices that were different, although the differences were small. The authority considered that the industry generally appeared to be well organised and the quality was satisfactory.

(v) The terms and conditions of supply, particularly as regards discharge lamps, appeared to be standard between manufacturers holding BSI Licences and there was apparently no competition between them.

(vi) ELIC lamps were quoted at the same discounts from all the suppliers and, for convenience, these brands were bought mainly from a local wholesaler. 'In spite of some consumer opposition to lamps not made by members of the ELIC group, the Corporation has purchased nearly one half of its total lamp requirements (other than those for street lighting purposes) from manufacturers not in the ELIC group and very few complaints have been received over a number of years. Deliveries have been good from all sources and every consideration has been given with regard to breakages or faulty goods on the few occasions required. It is not understood why the gap in prices should be so great between the ELIC group and other manufacturers but there appears to be more reluctance on the part of technically staffed departments to use non-ELIC lamps though we have no concrete evidence that they are inferior.' No competitive prices could be obtained for sodium lamps. Second brands of long life GLS lamps were bought on the basis of lamp life reliability and were said to 'reduce labour spent in replacing faulty lamps on street lighting patrols'.

(vii) Any supplier who offered a larger discount than ELIC would be given a share of the contract if the lamps passed the appropriate test. 'All firms, ELIC and non-ELIC, quote the same list prices for lamps.'

(viii) 'Occasional delays in delivery occur because the mass production machinery must turn out very long runs of each individual type of lamp. Quality is invariably good. The level of prices charged is virtually uniform throughout the industry and does not offer any incentives for bulk purchase. The very fact that a local authority can purchase lamps from a wholesaler as cheaply and perhaps even more cheaply than from the manufacturer indicates that the best possible terms are not being offered to large users.'

(ix) 'Although ELIC firms still continue to quote common list prices and discount terms, the only difficulty in obtaining competitive prices is in respect of discharge lamps.'

(x) 'From say 1950 to 1955 it was possible to call for tenders from suppliers and be assured that the prices were competitive despite the Electric Lamp Manufacturers' Association's agreement. When the Electric Lamp Industry Council was introduced the manufacturers held fast to their price and discount structure and it was difficult to find a manufacturer who would cut his price—but better prices could be obtained from wholesalers who were quite willing to pass on part of their extra discount in order to obtain the business. As mentioned already the latest trading arrangements give no benefit in dealing with wholesalers direct. The prices and discounts offered by the suppliers are virtually the same and any betterment of these terms can only be obtained on an unofficial basis

between the firm and the purchaser and this arrangement is not made public to the Electric Lamp Industry Council.'

(xi) 'The main comment in regard to the general supply situation is the lack of competition from firms within the ELIC group and the diminishing number of firms outside this organisation as a result of take-overs and rationalisation of supplies. This applies particularly to the manufacturer of component parts where it is understood that, for example, envelopes are supplied to a number of firms from one source.' Bulk requirements of GLS lamps were obtained from Ismay, other types were obtained from a local wholesaler whose terms were identical with those of ELIC. 'There appears to be no competition whatsoever as far as ELIC manufacturers and the majority of their wholesalers are concerned.'

(xii) Apart from changes in price and discount structure 'the general trading principles appear to be little changed since 1950'. 'All suppliers are found to be keen to gain and retain business. Although most brands of lamps are purchased, it is understood that there are only three manufacturers of sodium and mercury lamps and that some of the smaller firms are partially or wholly controlled by the larger manufacturers. It is known also that from time to time the main manufacturers supply lamps with their own brand name, but which were made in competitors' factories.'

(xiii) 'All manufacturers within ELIC market their products at identical prices and discounts.' This authority referred to having seen a machine producing fluorescent lamps bearing several brand names not all of which were marketed by the manufacturer or its subsidiaries.

(xiv) The only point of criticism to be levelled at the industry was that the submission of tenders appeared to be contrived. 'The fact that there is in existence this Discount Structure and classification key obviously points to an agreement or arrangement between the "ring" manufacturers, and one gains the impression that where any particular manufacturer is initially successful in obtaining a contract, other manufacturers never make any serious effort to submit a more competitive tender in the future. One is aware, of course, that there must also be some agreement or arrangement in connection with the supply of various parts of a lamp to manufacturers in general, since lamp caps, lamp metals and glass bulbs are obtainable from only two sources.'

(xv) 'The present arrangements especially for the purpose of discharge lamps are not fully competitive. The discounts are the same for the large and small purchaser, irrespective of the size of purchase. It is felt that the ELIC discounts are extremely unfair to the Local Authority faced with a large annual purchase of electric lamps. Discounts should be given on an annual purchase basis, similar to those obtained for tungsten lamps outside ELIC.'

(xvi) Two local authorities said that occasionally batches of lamps were not satisfactory. One of these said: 'Sometimes a batch of lamps will not be up to standard'.

455. In July 1967 we received from the Board of Trade a copy of a letter from a local authority whom we had not approached. The letter referred to identical tenders received for sodium discharge lamps and fluorescent lamps from the four principal manufacturers and one wholesaler; 'when my Council is incurring this

amount of expenditure, they wish to be satisfied that the prices are competitive and I think this justifies requesting you to examine the matter'. Another local authority not approached by us also wrote to us in July 1967. The letter said that the Council had expressed its concern at the level tenders received for sodium discharge lamps. In January 1968 another local authority wrote to us about tenders received for the supply of various types of lamps for street lighting for the year 1967/68, six of which were identical or virtually identical.

456. As shown in chapter 5, in April 1967 BLI, followed by the other members of ELIC, ceased to classify local authorities by types and populations and introduced a uniform discount of 40 per cent off list prices for filament lamps and fluorescent lamps. The uniform 12½ per cent for sodium and mercury discharge lamps was unchanged. In late 1967/early 1968, the principal manufacturers claimed that there was an increasing tendency for more of the reference lamp business of local authorities to be handled by wholesalers, and that there was increasing competition between wholesalers for this business. To test these claims, further evidence was obtained in February and March 1968 from nineteen of the twenty-four authorities who had supplied information in 1966. Seven authorities reported that improved terms on main brands had been offered by wholesalers. On the other hand, one authority said that its wholesaler had withdrawn an additional settlement discount it had previously given, as the new rate of 40 per cent introduced in April 1967 had reduced his margin; and another said that in view of the very small margin of profit that the wholesalers were now working on, the monthly settlement discount had been reduced. As regards any increase in the amount of business placed with wholesalers, almost all the authorities reported that there had been no changes in their purchasing arrangements; none said that they had transferred business from manufacturers to wholesalers. The information and observations received included the following:

(i) 'The position regarding quoted prices has not changed substantially since 1966.' Tenders are not invited from wholesalers as it is believed that there is nothing to be gained 'as, at present, the prices to local authorities are apparently fixed by the manufacturers'.

(ii) A copy of the tenders received showed competitive tenders for second brands of filament lamps and fluorescent lamps. The tenders for sodium lamps from the principal manufacturers were identical and there were very small advantages in those from wholesalers. In connection with an inquiry for the supply of 2,000-hour long life filament lamps, Philips had offered a lamp rated at 10 volts above normal supply which it had said would provide a similar life to the 2,000-hour lamps.

(iii) For sodium lamps, 'two local wholesalers had offered an additional 1¼ per cent compared with the ELIC rates'. For other types of lamps, there had been no change in the position since 1966 and no competitive quotations for ELIC lamps had been received from manufacturers or wholesalers. This authority later referred to the new quantity terms introduced by Philips on 1st March (see paragraph 322), but said it had not so far taken advantage of these 'because lamps to the value of £500 are not often required'.

(iv) 'During the last few months several local wholesalers have been offering supplementary discounts on certain ELIC makes, varying between an extra 2½ per cent and 10 per cent. These have been stated to be purely temporary and in some cases have only lasted a week or so. Naturally

full advantage has been taken of them with the result that in the last month or so all Corporation supplies of tungsten lamps and fluorescent tubes have been obtained from wholesalers. The only non-ELIC make purchased remains Luxram. These again have recently been purchased from a wholesaler who offers an extra 2½ per cent discount.' Similar supplementary discounts, said to be only temporary, had been offered on certain ELIC discharge lamps purchased from some wholesalers. This authority said that 250-volt lamps represented 90 per cent of GLS lamps purchased by the department mainly responsible for street lighting. It had found 'that by operating a 250-volt lamp on a 240-volt supply, the working life of the lamp is somewhat lengthened. This is considered to more than compensate for the slight decrease in light strength'. The authority had not been offered any make of long life GLS lamps.

(v) Sodium and mercury discharge lamps were obtained from a wholesaler who allowed an additional discount of 2½ per cent over the terms allowed by the manufacturers.

(vi) Two wholesalers awarded the contract for sodium lamps allowed settlement discount of 3¾ per cent against the 2½ per cent offered by the manufacturers.

(vii) Competitive tenders for 1967/68, which showed small variations in the prices quoted by ELIC manufacturers, had been received in response to public advertisement.

(viii) 'Towards the end of 1967 the Lighting Department were offered an extra 12½ and 2½ per cent off a main manufacturer's brand of sodium lamp prices by a local wholesaler, but this was for a very limited period. At that time the manufacturer would not match the offer. Since then, they have been able to obtain an extra 10 per cent off certain sodium lamps from the same main manufacturer.'

457. We mention the GLC specifically, as it places the largest contracts for lamps of all local authorities, and we were told by the leading manufacturers that it was regarded as being outside their standard discount arrangements for local authorities (see paragraph 230). The GLC is not responsible for street lighting and its contracts for electric lamps, which are available to all the London boroughs, do not cover lamps for street lighting. The GLC told us in 1966 that the tenders it received showed 'a strong competitive element'. It commended as excellent the distribution service of the ELIC member awarded in 1966 a two-year contract, estimated at over £100,000 including non-reference lamps; the lamps were required to be delivered in relatively small quantities to about 5,000 points, mainly in the Greater London area. The majority of the London boroughs had taken advantage of the favourable terms of the contract. Later, the GLC told us that for the 1968 contract it had invited tenders from ten BSI Licence holders and had received ten quotations. The contract was awarded to the previous contract holder on a small advantage over the terms offered by the two other major manufacturers, which had been identical. The GLC said 'there is some competition in this industry today, but it is somewhat limited by the very small number of firms with the necessary resources to be able to undertake a contract of this size (£137,000 a year)'.

Industrial and commercial users

458. In 1966 we obtained information and observations from 25 industrial and commercial users of reference lamps, generally known as trade users, whose

purchases of reference lamps in 1965 ranged from £150 to £45,000 with one at £130,000. At that time, the discounts on filament lamps and fluorescent lamps allowed to trade users and gas boards by the members of ELIC, individually, were related to total purchases of lamps from all sources and there were three classes. The discount for trade users with total annual purchases of under £1,000 and non-NHS hospitals was 20 per cent; for trade users and gas boards in the £1,000–£9,999 class and NHS hospitals the discount was 27½ per cent; and for trade users and gas boards in the £10,000 and over class the discount was 37½ per cent. As we have shown in earlier sections, a few large trade users were allowed additional discounts or discounts higher than those appropriate to their grading by all the members of ELIC. In general, the special discount was first allowed by one member of ELIC for prestige, reciprocal trading or other reasons and, after notification through ELIC, this concession was then followed by the other members. These special discounts and also the gradings resulted in anomalies. For example, an oil company with total purchases of £4,200 in 1965 was allowed a special discount of 42½ per cent by all the ELIC members, whereas a retail clothier with a large number of branches, whose purchases amounted to £30,000 in 1965, was allowed the standard graded discount of 37½ per cent. There were a number of other anomalies in the rates of discounts reported.

459. Various purchasing arrangements for lamps were reported by the witnesses. A few invited tenders from selected suppliers; others ordered bulk requirements for particular periods; and others bought as and when lamps were required. All bought ELIC members' main brands, some only from the manufacturers, some only from wholesalers and some from both sources. Eight of the users also bought non-ELIC brands direct from the manufacturers and one bought also from a wholesaler. Several of the users had some responsibilities for external lighting in yards, wharves, sidings and the like. Filament, fluorescent and discharge lamps were bought for this use, but discharge only to a very limited extent. The discount reported for discharge lamps was 7½ per cent, or in a few instances 12½ per cent.

460. Information and observations received in 1966 included the following:

(i) ELIC brands were bought from the manufacturers and from wholesalers. The prices charged by most suppliers were broadly the same although some wholesalers offered better terms. The suppliers were co-operative and helpful, the quality and reliability of ELIC brands was good and delivery and service were very good. 'The price level had remained steady over a number of years.'

(ii) A user buying for itself and other companies in its group said there was no price competition between the leading manufacturers of electric lamps. Colours of fluorescent lamps varied between manufacturers and in order to keep the colour constant it was necessary to buy from one supplier.

(iii) 'There is no difference in the price charged by different suppliers for comparable lamps.'

(iv) The discount rate had nearly doubled since 1950 but prices had also risen. 'Generally all suppliers seem to charge the same prices for equivalent lamps and pricing would not appear to be competitive.'

(v) 'Our experience with suppliers in the "ring" has shown that all prices and discounts are identical.' 'It does appear to us that the "ring" still operates and we are able to buy lamps outside the "ring" cheaper, and of equal quality, than the price quoted to us by members of the "ring".'

(vi) The bulk of requirements was obtained from a wholesaler; the only competition between wholesalers lay in the service, as prices and terms were identical.

(vii) An approach was made to a member of ELIC for an increase in discount on the ground that the user qualified for the next grading; the user claimed to have been given to understand, unofficially, that the supplier would need to consult ELIC before any increase could be granted.

(viii) Requirements were obtained from a wholesaler and a second brand company. Service was good and free replacement of faulty lamps was satisfactory.

(ix) Contracts were placed annually with five members of ELIC which suited the user's scattered delivery points. 'The only comment we can make is that there would appear to be no competition pricewise.' Organisation of the industry was generally regarded as efficient.

(x) The arrangements were not fully competitive in that there was only a handful of large manufacturers and little difference in quality and price between the products of each. Quality was regarded as reasonably constant and had improved over a period of years. The degree of standardisation could be improved throughout the industry.

(xi) 'We would recommend examination of the question of what are called long life filament bulbs as there seems to be a wide divergence of view over what comprises a long life bulb, the number of hours' life expected, how the performance is arrived at e.g. by additional filament or underrating the voltage etc.'

(xii) 'Non-ring lamps are non-existent.'

(xiii) 'We view the need for prices of all lighting equipment to be made as competitive as possible and deplore the fixing of minimum price structures by manufacturers' associations and wholesale distributive outlets. Wholesalers, particularly, should be permitted to operate freely without restraint on discount structures.'

(xiv) 'Present arrangements in the industry are not considered fully competitive since identical prices for identical lamps are quoted invariably by all suppliers solicited.' 'If manufacturers were left to establish their own selling prices independently of each other, the more efficient firms would be encouraged to lower their prices. The less efficient suppliers would be forced to improve their performance in order to survive, with the consequent re-establishment of competition within the industry.' Trading conditions were considered not to have altered substantially since 1950.

461. The largest user approached, whose lamp purchases in 1965 totalled £130,000 and which has fifty ordering points, said that until 1960 it had spread its lamp business between ten suppliers as there was then no inducement to concentrate purchases. However, at about that time suppliers began to offer additional incentives for increased turnover, and it now considers the market to be more competitive than in 1950. This user was amongst the very small number of buyers regarded by the members of ELIC, individually, as outside their standard discount arrangements (see paragraph 230).

462. Resale price maintenance was abandoned in April 1967. No changes were made by BLI and by the other principal manufacturers in terms to trade users

when the variations in discounts to distributors and local authorities were introduced in April 1967. In view of the principal manufacturers' claims in late 1967/early 1968 that there had been an intensification of competition in the last six to eight months of 1967, further information was obtained in February and March 1968 from ten of the trade users who had supplied information in 1966. Four reported that there had been no increase in competition or changes in the discounts offered. Five reported the offer of competitive discounts; in two cases by manufacturers and in two cases by wholesalers. The fifth said that a little more variation in the discounts offered had been noted, but the industry was still considered to be not fully competitive. The remaining trade user had purchased the bulk of its requirements from a second brand supplier in 1966, and was continuing to do so; the lamps were of the long life filament type. The trade user whose evidence is included at (vii) in paragraph 460 said that the discount of 37½ per cent which it now received from its supplier was in response to its request for a larger discount. The user told us that its supplier had 'in turn, communicated with ELIC who agreed to increase our discount and notify all other manufacturers and suppliers accordingly. No company has refused to give us this new rating, and we now understand that it is the largest we can obtain as a bulk buyer'. BLI's comments on this particular matter are in paragraph 629.

463. In addition to the comments included in this chapter which commended the quality of the lamps and the service and technical assistance provided by the manufacturers, similar comments were made by a number of the other users who supplied information.

CHAPTER 10

Prices, Costs and Profits

Prices

464. The manufacturers' recommended or published retail list prices of a selection of some popular types of reference lamps are given in appendix 8, table 1. The retail prices charged by Woolworth for some corresponding types of filament lamps are appended to the table since these appear to determine the level of retail prices of second-brand filament lamps generally.

465. We have compared the list prices (excluding purchase tax) of three types of reference lamps in 1948 with those in 1966 and have noted that the prices of a 100-watt filament lamp and an 80-watt fluorescent lamp are now lower than in 1948 and that in 'real terms' the prices of all three lamps are lower. The lower prices have been achieved despite a marked increase in labour costs and a more than trebled price for brass, one of the principal materials used in the manufacture of lamps. To illustrate this point certain indices are given in appendix 8, table 2. The indices have been derived from various published government statistics. No attempt has been made in table 2 to compare the current prices of sodium and mercury discharge lamps with those for earlier years; as has been explained in paragraph 6 these lamps have been the subject of intensive and rapid development since pre-war and comparisons of price might be misleading. However, examples of net prices, light output and life of two representative lamps are given in appendix 8, table 3 for the years 1951–1968.

466. Movements in the list prices (excluding purchase tax) of some representative types of main-brand lamps in the United Kingdom in the years 1956–1967 are given in appendix 8, table 4.

467. The list prices (excluding all taxes) of a selection of lamps in certain European and North American countries are given in appendix 8, table 5: filament for 1951 and 1966 and fluorescent for 1962 and 1967.

Costs and profits

468. We obtained the figures of trading results (sales, costs, profits and capital employed) in reference lamps of the major suppliers and of several of the smaller suppliers, including the Controlled Companies, for periods up to five years. We also obtained figures for the components company owned by BLI and the four components companies owned jointly by BLI and GEC.

469. We have included as costs all normal production, selling and administration expenses and have taken capital employed in any year to be the mean between the figures of the net assets employed at the beginning and end of the year. Except in the case of Philips Electrical (referred to as Philips throughout this chapter), whose assets are included at current values, fixed assets are included at original cost less depreciation as charged by the companies; the depreciation charges were reasonably comparable with depreciation at normal Inland Revenue rates. All the major suppliers of lamps have substantial business which is outside our reference, and costs and capital have been allocated to the trade in reference

goods on the bases that appeared most appropriate after discussion with each company. Some of the allocations we have adopted have not been accepted; in such cases we record the objections of the company concerned, and the effect of its alternative proposals.

470. In the following paragraphs we first deal with the reference trading results of BLI, and its two main competitors Osram and Philips; we then bring together their results and compare them. In the cases of BLI and Osram, the trading results include these companies' subsidiaries (AEI L & L, Atlas, Ekco, Astralec and Omega in the case of BLI; and Pope's and Ascot in the case of Osram). In the case of Philips, the trading results include those of its subsidiaries, Stella and Corona, but not Luxram and Kingston which were acquired only in 1965 and 1966 respectively, whose operations are not integrated with Philips and whose trading results we deal with separately. We next summarise the results of some of the smaller lamp manufacturers; discuss the profitability of some of the companies supplying components; and finally, and briefly, we give an indication of unit costs for two popular types of GLS lamps.

471. For BLI, Osram and Philips the sales and profits are available for filament lamps and for the two divisions of discharge lamps, namely fluorescent lamps and mercury and sodium discharge lamps, but the allocation of capital was possible only for filament lamps and discharge lamps in total.

BLI

472. The figures given here cover the results for Thorn (two years ended 31st March 1964) and AEI L & L (year ended 31st December 1963) before the merger, and for BLI for the period of two years and ten months from the effective date of the merger on 1st June 1964 up to 31st March 1967. The sales and profits for the main reference lamp categories in these periods are given in the following table:

	Reference total (£'000)	Filament lamps (£'000)	Discharge lamps: Discharge total (£'000)	Discharge lamps: Fluorescent lamps (£'000)	Discharge lamps: Mercury and sodium lamps (£'000)
(i) SALES					
AEI L & L 1963	4,045	2,636	1,409	806	603
Thorn					
1962/63	4,103	2,297	1,806	1,693	113
1963/64	4,846	2,619	2,227	2,082	145
BLI					
1964/65 (ten months)	8,788	5,117	3,671	2,854	817
1965/66	11,381	6,475	4,906	3,897	1,009
1966/67	11,138	6,232	4,906	3,793	1,113
(ii) PROFITS					
AEI L & L					
1963	113	12	101	56	45
Thorn					
1962/63	358	161	197	201	[4]
1963/64	618	357	261	263	[2]
BLI					
1964/65 (ten months)	857	469	388	287	101
1965/66	1,148	472	676	524	152
1966/67	1,076	317	759	544	215

473. The profits earned by BLI and its predecessors, expressed as percentages of reference sales, were as follows:

	Reference total (%)	Filament lamps (%)	Discharge lamps: Discharge total (%)	Discharge lamps: Fluorescent lamps (%)	Discharge lamps: Mercury and sodium lamps (%)
AEI L & L					
1963					
THORN	2·8	0·5	7·2	6·9	7·5
1962/63	8·7	7·0	10·9	11·8	[3·2]
1963/64	12·7	13·6	11·7	12·6	[1·3]
BLI					
1964/65 (ten months)	9·7	9·2	10·6	10·0	12·3
1965/66	10·1	7·3	13·8	13·4	15·0
1966/67	9·7	5·1	15·5	14·3	19·3

474. The rates of profit earned on capital employed in trading reference lamps, calculated on the basis of historic cost, are given below. Discharge lamps capital has not been allocated between the fluorescent lamps and the mercury and sodium lamps. In that certain components have been charged at component makers' cost only, but no components capital has been included, to a small extent these profit rates may be said to be over stated.

	Reference total (%)	Filament lamps (%)	Discharge lamps (%)
AEI L & L 1963	3·6	0·6	9·8
THORN			
1962/63	10·7	9·3	12·1
1963/64	13·6	15·6	11·7
BLI			
1964/65 (equivalent annual rates)	11·0	10·2	12·0
1965/66	13·6	9·5	19·4
1966/67	11·8	5·9	20·0

475. In commenting on these figures BLI has disputed our treatment of certain items and has submitted alternative figures:

(a) *Packing costs.* A part of BLI's trading is in the form of 'twinpacks' where a fluorescent fitting and the lamp are packaged together, which incurs a higher total cost for packing than if the fitting and lamp had been packed and sold separately. We have apportioned the extra packing cost in proportion to the normal unit packing costs, which has resulted in one-quarter of the extra costs being charged to lamps. BLI claims that the lamp is packed with the fitting only in order to increase the sales of lamps, and in particular of replacement lamps for that particular fitting, and therefore considers the whole of the extra packing should be charged against lamps.

(b) *Research and development.* The charges under this heading cover the development of new types of lamps, the use of new kinds of materials, the development of new or more advanced lamp-making machinery, the excess over 'normal' costs of running pilot plants, and laboratory work done to help solve technical

problems encountered by the sales personnel. We consider that all lamps sold benefit from these activities and have apportioned the costs for reference-type lamps between home (reference) and export in proportion to sales value. BLI maintains that research expenses are incurred primarily for the home market and that research costs should be allocated between home and export in the ratios of 90 : 10 for filament lamps and 95 : 5 for fluorescent lamps and discharge lamps. BLI has told us that most major new products developed are unlikely to be exported in any quantity for a number of years and that some types of lamps are not exported; that pilot plant production is used for home sales only; and that the technical sales problems tackled relate largely to home sales.

(c) *Goodwill.* We have excluded from capital certain sums paid by Thorn, over a period of four years, for the goodwill of the Apex (now Astralec) business in supplying 'Vesta' lamps to Woolworth. BLI maintains that these sums should be included in capital.

476. If the figures are calculated in accordance with BLI's views on these points, the rates of return on total reference sales shown in paragraph 473 would be reduced by about 1 per cent and the rates of return on capital shown in paragraph 474 would be reduced by between 1½ and 3 per cent. We give below the rates of return according to the company; the profits shown above relating to AEI L & L for the year 1963 are not affected:

(i) Returns on net sales value

			Discharge lamps		
	Reference total (%)	Filament lamps (%)	Discharge total (%)	Fluorescent lamps (%)	Mercury and sodium lamps (%)
THORN					
1962/63	7·4	6·9	8·0	9·4	[13·6]
1963/64	11·6	13·5	9·4	10·7	[9·7]
BLI					
1964/65 (ten months)	9·0	9·1	8·8	8·1	11·2
1965/66	9·1	7·2	11·6	11·1	13·3
1966/67	8·6	4·9	13·2	11·9	17·4

(ii) Returns on average capital employed

	Reference total (%)	Filament lamps (%)	Discharge lamps (%)
THORN			
1962/63	7·7	6·8	8·9
1963/64	11·0	12·2	9·4
BLI			
1964/65 (equivalent annual rate)	9·5	9·0	10·2
1965/66	11·4	8·3	16·3
1966/67	9·8	5·2	17·0

Osram

477. Osram, for the reasons given in paragraph 481, does not accept our apportionments of 'fixed' expenses and capital, nor our calculations of the profitability of its trade in reference lamps. The profits shown in the next three paragraphs are therefore subject to this qualification.

478. Osram's sales and profits for the five years ended 31st March 1967 for the main categories of reference lamps are given in the following table:

	Reference total (£'000)	Filament lamps (£'000)	Discharge lamps: Discharge total (£'000)	Discharge lamps: Fluorescent lamps (£'000)	Discharge lamps: Mercury and sodium lamps (£'000)
(i) SALES					
1962/63	4,382	2,931	1,451	723	728
1963/64	4,455	3,017	1,438	722	716
1964/65	4,922	3,300	1,622	812	810
1965/66	4,898	3,277	1,621	860	761
1966/67	5,205	3,431	1,774	918	856
(ii) PROFITS					
1962/63	524	356	168	96	72
1963/64	560	335	225	109	116
1964/65	499	286	213	80	133
1965/66	614	348	266	123	143
1966/67	573	373	200	115	85

479. The profits earned by Osram, expressed as percentages of reference sales, were as follows:

	Reference total (%)	Filament lamps (%)	Discharge lamps: Discharge total (%)	Discharge lamps: Fluorescent lamps (%)	Discharge lamps: Mercury and sodium lamps (%)
1962/63	11·9	12·1	11·6	13·3	9·8
1963/64	12·6	11·1	15·7	15·0	16·2
1964/65	10·1	8·7	13·2	9·9	16·4
1965/66	12·5	10·6	16·4	14·4	18·7
1966/67	11·0	10·9	11·3	12·5	10·0

480. Osram's capital employed in trading in reference goods has been calculated on the basis of historic cost; it has been apportioned between filament and discharge lamps, but that for discharge lamps has not been allocated further between the fluorescent lamps and the mercury and sodium lamps. The rates of profit earned on reference capital are summarised below. These profit rates may be said to be slightly overstated because the capital does not include any part of the GEC headquarters building, nor does it include any element of components capital for certain items which are charged at components maker's cost only.

	Reference total (%)	Filament lamps (%)	Discharge lamps (%)
1962/63	17·2	18·2	15·4
1963/64	16·7	16·0	18·0
1964/65	18·1	17·0	19·8
1965/66	21·9	20·0	25·1
1966/67	17·9	18·8	16·5

481. The point of departure between ourselves and Osram concerns the allocation of costs and capital for reference-type lamps between home (reference) sales and exports. In the five-year period we have examined, lamp exports have varied from 12 per cent to over 16 per cent by value of total sales of lamps. In our opinion, when assessing the results of trading in this case a full allocation of costs and capital should be made to the trade in exports. In the company's opinion its export trade is marginal and it considers that only those items of cost and capital which are variable (that is, which relate directly to the exports concerned) should be allocated to its exports.

482. The profitability of trading in reference lamps assessed on Osram's basis is given in the following table. The effect on reference profits of allocating only variable costs and capital to exports would be to reduce the rates of return on total reference sales as shown in paragraph 479 by between 3 and 5 per cent and the rates of return on capital shown in paragraph 480 by between 6 and 10 per cent.

(i) Returns on net sales value

				Discharge lamps	
	Reference total (%)	Filament lamps (%)	Discharge total (%)	Fluorescent lamps (%)	Mercury and sodium lamps (%)
1962/63	8·8	9·4	7·7	9·8	5·5
1963/64	8·0	7·3	9·5	8·6	10·5
1964/65	6·2	5·4	8·0	5·3	10·8
1965/66	7·7	7·4	8·4	4·9	12·3
1966/67	7·3	7·9	6·2	7·5	4·9

(ii) Returns on average capital employed

	Reference total (%)	Filament lamps (%)	Discharge lamps (%)
1962/63	11·1	12·8	8·3
1963/64	9·4	9·7	9·0
1964/65	9·6	9·6	9·6
1965/66	11·7	12·8	10·0
1966/67	10·5	13·0	7·2

483. When assessed on our average cost basis, exports show a substantial loss; when assessed on Osram's marginal cost basis a small profit on exports is shown. For the year ended 31st March 1957 only, Osram has attempted to apportion export costs into reference-type and other types of lamps and suggests as an alternative method of computing profits aggregating the results for all reference-type lamps, whether home (reference) or export. By this method the total return on capital in 1966/67 would be about 12 per cent compared with about 18 per cent by the average cost method we have adopted or 10·5 per cent by Osram's marginal cost method.

Philips

484. The reference lamps trading results for Philips have been supplied for four periods covering three years and eight months up to 31st December 1966. These results are for Philips only and do not include those for its subsidiaries Luxram and Kingston. The sales and profits in the four periods for the main categories of reference lamps are given in the following table:

				Discharge lamps	
	Reference total (£'000)	Filament lamps (£'000)	Discharge total (£'000)	Fluorescent lamps (£'000)	Mercury and sodium lamps (£'000)
(i) SALES					
Year ended 30th April 1964	3,770	1,849	1,921	872	1,049
8 months ended 31st Dec. 1964	2,901	1,301	1,600	700	900
Year ended 31st Dec. 1965	4,724	2,023	2,701	1,133	1,568
Year ended 31st Dec. 1966	5,229	2,149	3,080	1,282	1,794
(ii) PROFITS					
Year ended 30th April 1964	215	142	73	5	68
8 months ended 31st Dec. 1964	406	138	268	56	212
Year ended 31st Dec. 1965	491	91	400	133	267
Year ended 31st Dec. 1966	376	68	308	51	257

485. The profits earned by Philips expressed as percentages of reference sales were as follows:

	Reference total	Filament lamps	Discharge lamps		
			Discharge total	Fluorescent lamps	Mercury and sodium lamps
	(%)	(%)	(%)	(%)	(%)
Year ended 30th April 1964	5·7	7·7	3·8	0·5	6·5
8 months ended 31st Dec. 1964	14·0	10·6	16·7	8·0	23·5
Year ended 31st Dec. 1965	10·4	4·5	14·8	11·7	17·0
Year ended 31st Dec. 1966	7·2	3·1	10·0	4·0	14·3

486. Philips' reference capital employed, including an allocation of part of the research capital of the NV Philips group, has been calculated on its normal valuation basis and has been apportioned between filament and discharge lamps, but no further allocation of discharge capital has been made as between the categories of fluorescent lamps and mercury and sodium lamps. The rates of profit earned on reference capital are summarised below. The profit rates may be said to be overstated because the capital does not include any part of the headquarters of Philips Industries and because it does not include any element of capital for certain components supplied at cost by an associated company; in Philips' opinion these exclusion are not significant. The equivalent annual rates of return are given for the period of eight months.

	Reference total	Filament lamps	Discharge lamps
	(%)	(%)	(%)
Year ended 30th April 1964	9·2	12·6	6·0
8 months ended 31st Dec. 1964	23·6	17·3	29·1
Year ended 31st Dec. 1965	20·2	8·0	31·1
Year ended 31st Dec. 1966	13·4	5·6	19·2

487. In computing capital we have excluded payments made on account of work in progress on new buildings which were not in use at each year end. The company does not accept our exclusion, which affects the last three periods only, and considers that the rates of return on capital should—in total—be up to 1 per cent less than as shown above. We give below the profit rates on Philips' basis:

	Reference total	Filament lamps	Discharge lamps
	(%)	(%)	(%)
8 months ended 31st Dec. 1964	23·5	17·3	28·9
Year ended 31st Dec. 1965	19·3	8·0	28·6
Year ended 31st Dec. 1966	12·6	4·9	19·2

488. As we have indicated above, Philips' assets are in its balance sheets at valuation, and are revalued at frequent intervals to reflect current price levels, whilst depreciation charged against profits is also based on the current valuations; the results given above are based on the valuations. From information supplied by Philips for the three accounting periods ended 31st December 1966 we have estimated the results of reference trading, basing capital values and depreciation charges on historic cost. These results are summarised below and show increases of up to 6 per cent compared with the results given above on Philips' valuation basis.

	Reference total (%)	Filament lamps (%)	Discharge lamps (%)
8 months ended 31st Dec. 1964	27·1	20·0	33·3
Year ended 31st Dec. 1965	23·9	9·8	36·6
Year ended 31st Dec. 1966	16·3	7·6	22·6

For the purposes of comparison we also give these results based on historic cost but including capital work in progress as capital employed as contended by Philips:

	Reference total (%)	Filament lamps (%)	Discharge lamps (%)
8 months ended 31st Dec. 1964	26·9	20·0	33·0
Year ended 31 Dec. 1965	22·7	9·8	33·3
Year ended 31st Dec. 1966	15·3	6·6	22·6

BLI, Osram, Philips: comparison of trading results

489. Having summarised the profits and returns on reference trading covering a four- to five-year period for the three main manufacturers, we now examine in more detail the results for the most recent two full years available and attempt to isolate and explain the differences. So far as has proved possible we have obtained trading results prepared on similar lines, but any comparison we attempt between the companies is affected by the following known factors:

(i) *Methods of cost allocation*

Because of the different methods of detailed cost allocation used by the individual concerns the costs and profits shown cannot be taken as absolute but only as offering a guide to the relative results in the three groups of reference lamps.

(ii) *Bought out lamps*

A large part of Philips' trade (around 45 per cent) is in finished lamps bought out largely from NV Philips—on which none of the United Kingdom Philips' *manufacturing* capital has been employed. Assuming this factoring trade is at least as profitable in terms of money as the sale of United Kingdom made lamps, the overall profit in terms of capital employed will be higher than that on the United Kingdom made lamps considered by themselves—ignoring all other implications.

(iii) *Asset valuations*

Philips' fixed assets are revalued at frequent intervals, and its results have been given in the schedules on Philips' revaluation basis, but after excluding capital work in progress.

(iv) *Exclusion of manufacturing capital*

Purchases by BLI and Osram from GTC and Lamp Metals are at cost. Philips' purchases of wire and glass components from Mullard are also at cost. As no capital in respect of these components suppliers has been brought into the lamp makers' figures, the latters' capitals may be said to be slightly understated. As all the three major lamp manufacturers are similarly affected however the exclusions should not significantly distort their comparative results.

(v) *Exclusion of administrative capital*

The capitals for Osram and Philips do not include the reference lamps share of the respective group headquarters. In each case the company has stated that the effect of the exclusion would be negligible.

Comparative performance

490. *Sales.* Schedule 1 shows that in 1966/67, the most recent year for which figures are available, BLI's sales of filament lamps and fluorescent lamps declined. The sales of Osram and Philips showed increases in all groups.

491. Filament lamp sales have been analysed into three classes by BLI and Osram. The analyses show a roughly similar pattern for these two companies:

	1965/66		1966/67	
	BLI (%)	Osram (%)	BLI (%)	Osram (%)
GLS	60	62	58	59
Photographic	11	9	11	10
Other	29	29	31	31
Filament total	100	100	100	100

GLS lamps alone accounted for about 34 per cent of BLI's total sales of reference lamps, and for about 40 per cent of Osram's. Philips' figures are not available, but in its case we estimate that roughly 20 to 25 per cent of its total reference sales were in GLS lamps.

492. *Profits.* Overall profit margins fell in the latest year for all three companies although in the main sales groups there was no common experience. BLI's margin on filament lamps dropped substantially but was partially compensated by an improvement in margins in the discharge groups; Osram experienced a marked decline in profits on mercury and sodium lamps; and Philips' margin on fluorescent lamps fell sharply. Nevertheless the results indicate that in general mercury and sodium discharge lamps were the most profitable group and filament lamps the least profitable.

493. *Costs.* The comparison of costs as broken down in Schedule 2 indicates that as a proportion of net sales value BLI's 'factory' cost (including bought out finished lamps) was less than for its rivals. This was counter-balanced by its higher selling expenses except in the case of mercury and sodium discharge lamps. Compared with the other companies, the BLI figures probably give a more accurate analysis of selling costs to mercury and sodium discharge lamps which go direct to users and local authorities rather than through wholesalers and retailers.

494. The fixed asset position of the companies is commented upon later (paragraphs 497–499) and this has a bearing on costs in as much as depreciation has to be taken into account. We have not got full details of the depreciation charges included in the various accounts but so far as plant, etc. is concerned it seems likely that, having regard to trade done, there would have been no great disparity of burden as between the companies. In the case of properties, where the significance of the burden might in any case be expected to be smaller (rates of write-off or amortisation would be lower than for plant: the amounts invested were smaller and the land element at least to some extent would not be written-down), Osram

clearly should have an advantage and BLI probably a slight disadvantage. In general, however, and taken overall it is probable that differences in the depreciation burdens of the various companies did not make important contributions to the differences in profit rates achieved.

495. The proportionate expenditure on research and development of BLI and Osram appear to be of a similar order, with that of Philips tending to be somewhat lower, the exception being the comparatively high research costs devoted by BLI to the mercury and sodium discharge lamps group. However, in each case the research charge applies only to the companies' own production in their United Kingdom factories; if the bought out lamps which are numerous in some categories—particularly with Philips—are eliminated the position may be shown as follows:

Research charges
(expressed as percentages of factory cost of lamps of own UK manufacture)

	Reference total (%)	Filament lamps (%)	Discharge total (%)	Discharge lamps: Fluorescent lamps (%)	Discharge lamps: Mercury and sodium lamps (%)
1965/66					
BLI	6·9	6·5	7·5	5·0	18·5
Osram	6·2	6·0	6·6	6·5	6·8
Philips	6·4	6·6	6·2	6·9	5·8
1966/67					
BLI	6·0	5·0	7·5	4·5	19·3
Osram	5·9	5·8	6·4	6·8	5·9
Philips	7·1	7·4	6·8	7·0	6·6

The table shows that BLI was devoting considerable research into the mercury and sodium discharge lamps category—the category in which relatively its sales of own lamps were poorest when compared with its competitors.

496. Selling, distribution and administration costs for Philips were reduced in 1966 compared with 1965 in spite of a substantial increase in the value of sales: this probably reflects savings achieved by the reorganisation of the whole of Philips Industries' selling and administration divisions which began in 1966. With the exception of the mercury and sodium discharge lamps category (mentioned in paragraph 493) BLI's costs for selling, etc., are proportionately some 25 to 30 per cent higher than those for Osram and Philips; this probably reflects two main factors:

(i) By March 1967 little headway had been made in amalgamating the separate sales and distribution systems for 'Atlas', 'Ekco' and 'Mazda'.

(ii) The sales organisation was expanded to handle the increased trade expected in 1966/67. When this increase did not materialise it took some time to re-shape the sales organisation.

497. *Fixed assets.* The average capital employed on reference trading by the three companies for the two years was analysed between filament and discharge lamps.

498. Replacement and re-building of plant and machinery tends to be a continuous process and the written-down values for all the companies are about half the original cost (or valuation in the case of Philips) as is shown by the following table. The somewhat higher figure for Philips in the latest year reflects the expansion of its production facilities at Hamilton.

Plant and machinery
Written-down values as proportions of cost (or valuation)

		1965/66 (%)	1966/67 (%)
BLI	Overall	47	45
Osram	Filament	44	43
	Discharge	53	53
	Overall	47	47
Philips (Hamilton only)	Filament	50	58
	Discharge	46	53
	Overall	48	56

499. The position with regard to properties is more complicated. The proportions that written-down values bear to cost (or for Philips, valuation) were as follows:

		1965/66 (%)	1966/67 (%)
BLI	Overall	83	82
Osram	Filament	49	48
	Discharge	69	68
	Overall	55	55
Philips (Hamilton only)	Filament	54	51
	Discharge	58	75
	Overall	57	70

The high proportion that written-down value bears to cost for BLI reflects its modern works and offices and Philips' values reflect the recent extensions at Hamilton, particularly for production of fluorescent lamps and sodium lamps. On the other hand, two of Osram's three lamp factories (Shaw and Team Valley) are leasehold and the third (Wembley) is almost fully depreciated. In the circumstances the proportion of Osram's written-down value to cost is lower than for the other companies; and about half this written-down value represents depots —the proportion is high due to the low residual value of the Wembley factory.

Performance ratios

500. The foregoing paragraphs have constituted a general commentary on the main producers' trading results and provided pointers to differences between them. In the following paragraphs we consider the break-down on the profit/capital ratio into various subsidiary ratios to demonstrate the effect of those differences in so far as they contribute to different levels of achievement by the companies. The ratios considered are set out in Schedules 3 and 4 for the two years 1965/66 and 1966/67 respectively. In the absence of sufficient statistical data it has not been possible to pursue the matter of relative cost efficiencies except in so far as these are influenced by the ratios to which reference is made; in any event

the period covered by our enquiries has been one of change, particularly for BLI, and comparisons, whether between companies or over time, would be less easy to make than when changes were less numerous.

501. The key ratio or index of overall success is the return on capital (ratio No. 1) which mirrors all the decisions, transactions and price movements relative to the use of funds that affect the trading results. It is the product of the profit rate on sales (ratio No. 2) and the number of times capital is 'turned over' in terms of sales (ratio No. 3). It is clear that this relationship must be broken down in order to appreciate the underlying factors which influence profitability; it is also clear, if valid comparisons are to be made, that there should be uniformity in the factors involved. When comparing different companies, however, the latter presents difficulties and part of the difference arising is usually due to figures being compiled on different bases. In the present instances the figures were prepared on similar principles so far as was possible but, nevertheless, there are some differences to which reference has already been made.

502. It is apparent that BLI obtained a lower return on reference capital than either Osram or Philips although in 1966/67 it improved its own performance and did better than Osram with discharge lamps. All three companies showed declining returns overall and on filament lamps. If looked at in terms of the return on sales, here also the overall rates for each company declined but BLI's rate for all sales was better than that of Philips in 1966/67 due to Philips' relatively marked fall in the rate on discharge lamps coupled with an improvement by BLI in that field. For filament lamps BLI's rates in both years were better than Philips but not so good as those of Osram (whose rate improved slightly in 1966/67).

503. As indicated above, the relationship between the two ratios just mentioned is expressed by the sales/capital ratio. As can be seen from item 3 on the two relevant schedules, BLI's ratios were lowest in both years and Philips were the highest; furthermore, in all cases except that of Philips' filament activities the ratios were smaller in 1966/67 than they were in 1965/66. Thus BLI required more and Philips less capital per sale than their competitors; and all three companies used more capital per sale in 1966/67 than in the previous year (although Philips used rather less on filament lamps). Part of the explanation was BLI's fall in filament sales in 1966/67 (its discharge lamp sales in total were unchanged) while the sales of its competitors rose in each department (see paragraphs 490 and 491); this would have tended to reduce BLI's ratio but to increase the ratios of its competitors. A subsidiary factor in this connection was probably the low profit margin earned by BLI on its filament lamp trade with Woolworth. The other part of the explanation was the increase in capital for both filament and discharge lamps by all three companies which had a reducing effect on the ratios.

504. The tables of ratios (Schedules 3 and 4) at items 4 to 7 show the sales/capital ratios broken down. From the figures it can be seen that the main disparities were caused by the different fixed assets values of the companies rather than by the holdings of net current assets (stocks, debtors and creditors). So far as the current assets were concerned, BLI's stocks in relation to factory costs were the largest—possibly because of the number of brands of lamps—and the increase in 1966/67 was no doubt attributable to its drop in trade in that year; Philips' stocks were lowest due to its smaller raw material holdings (it 'buys out' a large proportion of its lamps) and a reduction in 1966/67 reflected one result of its internal reorganisation. There were apparently no great differences between the

companies so far as debtors and creditors were concerned but it is noticeable (from items 8 to 11 in the Schedules) that BLI gave the longest credit and took the shortest, thus automatically—compared with the other two companies—increasing its investment in net current assets.

505. As regards the fixed assets, of which, relatively, BLI carried more than its two competitors, part of the difference with Philips (which was reduced in 1966/67 compared with 1965/66) would have been due to the latter's high proportion of trade in 'bought-out' lamps which did not require manufacturing capital; if allowances were made for this, however, there would have been a much less significant difference between the companies. With regard to properties, as it has already been explained (in paragraph 499) BLI's figures reflected expensive works and offices which contrasted markedly with Osram's older and well-depreciated properties. So far as Philips was concerned the effect on its sales/property ratio, in 1966/67, of its expansion of manufacturing facilities for discharge lamps is apparent (its corresponding expansion for filament lamps did not take effect until 1967/68).

506. As indicated above cost ratios have not been dealt with here except for the brief references to costs made in paragraphs 493 to 496. It may suffice here to mention again that Philips has been recently engaged in a reorganisation some fruits of which have already been seen; and that BLI apparently had an advantage in factory costs which was offset by the improvements it aimed at in distribution not having so far materialised.

The smaller manufacturers

507. BLI, Osram and Philips (excluding Luxram and Kingston) supply between them about 83 per cent of total home sales of reference lamps. Of the remaining 17 per cent, Crompton accounts for about 6½ per cent, Luxram and Kingston for about 3 per cent, the Controlled Companies for about 4 per cent and the remaining 3½ per cent is shared by eight small independent companies, including BELL.

508. We have obtained information on the results of reference trading for the Controlled Companies, and overall trading results from all the other companies named above and for British Luma* and Maxim, which are the only small independents manufacturing GLS lamps (the independents we have not approached for this purpose supply between them less than 2 per cent of the total supply of reference lamps). In the cases of BELL and British Luma we understand non-reference trading is insignificant, and only in the case of Luxram is it important—being about half of total trading.

509. Several of the companies are, or were, private family controlled businesses (BELL, Luxram, Kingston and Maxim). The profits of these companies tend to be influenced by the policy adopted for remunerating directors: on occasions profits may be partly distributed by way of directors' remuneration rather than by dividends (one objective being to minimise taxation), whilst on other occasions such remuneration is restricted, or if voted, not drawn—particularly when the business requires finance. In assessing Maxim's results we have substituted notional sums for directors' remuneration in place of the charges in the financial accounts.

*See footnote to paragraph 327.

510. We give below in summary form two periods' results for these smaller manufacturers, taking the Controlled Companies together, with average capital employed calculated on the historic cost basis:

	Period	Sales : capital ratios (capital = 1·0)	Returns on Sales (%)	Returns on Capital (%)
1964/65				
BELL	Year ended 30th March	1·40	11·0	15·5
British Luma	Year ended 28th May	N.A.	8·5	N.A.
Controlled Companies	Year ended 31st March	1·92	7·7	14·8
Crompton	Year ended 30th June	1·76	5·4	9·5
Kingston	Year ended 31st August	1·76	9·4	16·6
Luxram	Year ended 30th June	2·65	9·6	25·4
Maxim	Year ended 31st March	5·08	1·8	9·1
1965/66				
BELL	Year ended 30th March	1·39	10·9	15·1
British Luma	Year ended 28th May	1·98	10·1	20·1
Controlled Companies	Year ended 31st March	2·15	[2·8]	[6·0]
Crompton	Year ended 30th June	1·81	4·5	8·1
Kingston	16 months ended 31st Dec.	2·06	13·8	28·5
Luxram	18 months ended 31st Dec.	2·34	11·7	27·5
Maxim	Year ended 31st March	4·73	2·6	12·4

511. BELL revalued its premises as at 31st March 1965 but it does not charge depreciation on its premises. Crompton revalued its premises only as on 1st July 1963. Luxram and Kingston revalued their premises and plant, after the Philips pattern, as on 1st July and 1st September 1965 respectively. The results for these four companies, if computed with capital on the companies' revaluation bases, would be as follows:

	Period	Sales capital ratios (capital = 1·0)	Returns on Sales (%)	Returns on Capital (%)
1964/65				
BELL	Year ended 31st March	0·99	11·0	10·9
Crompton	Year ended 30th June	1·54	5·1	7·9
1965/66				
BELL	Year ended 31st March	1·00	10·9	10·9
Crompton	Year ended 30th June	1·61	4·2	6·8
Kingston	16 months ended 31st Dec.	1·50	12·9	19·4
Luxram	18 months ended 31st Dec.	1·43	9·5	13·7

512. The results of the smaller manufacturers show that they have been able to compete with the 'big three' and achieve reasonable profits; the two most profitable concerns, Luxram and Kingston now being within the Philips organisation. But it is not possible, because of differing characteristics of trade, to compare one company directly with another, or with the main manufacturers.

The suppliers of components for reference lamps

513. The main components of reference lamps are the glass envelopes (bulbs or tubes), other glass products (tube, rod, flanges), caps and wires (including coiled filaments and electrodes). Four of the seven companies supplying these components are owned jointly by BLI (through AEI L & L) and GEC and a fifth is owned wholly by BLI. It is the results of these five companies which are considered here.

Glass Bulbs Ltd.

514. Glass Bulbs has two divisions, the bulb division, and the pressing division which produces glass lenses and reflectors, principally for sealed beam headlamps for motor vehicles. Almost all the products of the bulb division are for electric lamps* (including non-reference), but some other items are made which are not connected with electric lamps. One important feature is the high value of exports which is clearly illustrated in the following summary of sales and profits of the bulb division for the three years ended 31st December 1965:

	1963		1964		1965	
	(£'000)	(%)	(£'000)	(%)	(£'000)	(%)
NET SALES						
Home: For electric lamps	837	32·5	740	23·8	597	18·0
Other products	57	2·2	332	10·7	379	11·5
Export	1,311	50·8	1,591	51·1	1,749	52·9
Parents	374	14·5	448	14·4	581	17·6
	2,579	100·0	3,111	100.0	3,306	100.0
PROFITS	444	17·2	479	15·4	647	19·6
AVERAGE CAPITAL EMPLOYED	say 2,300		say 2,300		2,355	
RETURN ON CAPITAL		19·3		20·8		27·4

The average capital employed in the bulb division is available only for 1965, but from the overall capital we think there would not have been any marked change in the previous two years. A fire in January 1963 disrupted production and goods were bought in from GTC until early 1964; the effects of the fire are reflected in the above results.

515. Sales to parents are at 'cost plus 6 per cent': on the assumption that the sales/capital ratio is similar on sales to all customers, the profits may be restated as follows:

	1963 (%)	1964 (%)	1965 (%)
Return on sales:			
Parents	5·7	5·7	5·7
Others	19·2	17·0	22·5
Return on capital:			
Parents	6·3	7·6	7·9
Others	21·5	23·0	31·5

Glass Tubes and Components Ltd. (GTC)

516. In the reference field this company manufactures the bulbs which cannot be produced on, or which it is not economic to produce on, the ribbon machines operated by Glass Bulbs; some are machine made, but most are blown by hand. It also manufactures glass tubing for fluorescent lamps (in competition with Chance Bros.) and lead glass tubing and rod for components for filament lamps and some discharge lamps (in competition with Chance Bros.). GTC also makes a number of glass products not concerned with lamps.

* The pear shaped bulb R/PS. 60 (used in GLS lamps of from 15 watts to 100 watts) accounts for nearly half of total bulb production.

517. The company commenced trading in 1962 and the period for which we have details of trading was one in which the original resources of the parents were being combined and rationalised. The emergency production required as a result of the fire at Glass Bulbs in 1963 caused the closure of one factory to be postponed for a year. These happenings are reflected in the results.

518. It was not possible to get other than overall figures for 1962 and 1963, and in both years losses were incurred. For 1964 and 1965 the company was able to provide details of its trading in 'electrical glass', but owing to the diversity of uses to which these products might be put, it was unable to isolate the trade in components for reference lamps only. The figures provided showed that on electrical glass products losses were incurred in both years before charging either the management fee payable to the parent companies or, in 1964, the losses associated with the closure of the factory which had been kept open to provide emergency production (see paragraph 517). Sales to parents were at full cost but before taking into account the management fee and without addition for profit, therefore, the losses sustained were on the other home and export customers for electrical glass; we understand that large export orders, in particular, are often accepted at marginal prices which recover direct costs and variable overheads and make contribution towards fixed overheads. The sales and losses on electrical glass for the two years ended 31st December 1965 may be summarised as follows:

	1964			**1965**		
	Sales		Losses	Sales		Losses
	(£'000)	(%)	(£'000)	(£'000)	(%)	(£'000)
Other customers: Home	738	38·0		679	32·3	
Export	353	18·2		351	16·7	
	1,091	56·2	29	1,030	49·0	48
Parents	851	43·8	NIL	1,069	51·0	NIL
	1,942	100·0	29	2,099	100·0	48

Lamp Metals Ltd.

519. Lamp Metals was formed in 1961, at about the same time as GTC, to merge the separate manufacturing interests in lamp and valve wires of AEI and GEC. The company does not supply coiled filaments. The company is in competition with Mullard, which it acknowledges to be the market leader (Mullard produces coiled filaments as well as wire). Most of Lamp Metals' trade is with its parent companies—about 75 per cent by value—and supplies are taken at cost (currently, the provisional invoicing is at the relevant Mullard prices and the adjustments to cost are made periodically).

520. We have been given trading figures relating to the three years ended 30th September 1965 and summarise them below. Lamp Metals was unable to identify separately products for reference lamps only. In giving the trading figures we have excluded the special expenses incurred on the new Gateshead factory, and the additional credits provided by the parent companies to offset trading and other losses.

	1963 (£'000)	1964 (£'000)	1965 (£'000)
SALES			
Other customers:			
Home	194	207	197
Export	78	76	88
	272	283	285
Parents (at cost)	741	832	729
	1,013	1,115	1,014
PROFITS [LOSSES] ON OTHER CUSTOMERS	[43]	29	[12]

Lamp Caps Ltd.

521. Lamp Caps, which was formed in 1922 by GEC and AEI, produces vitrited caps and accounted for about 70 per cent of production of these items in the United Kingdom in 1966, and the whole from 1967 when the trade and resources in vitrited caps of the only other producer, Lamp Presscaps, were transferred to Lamp Caps. About half Lamp Caps' total production is said to be of the standard bayonet type of vitrited cap for GLS lamps and a further 10 per cent is in other sizes for automobile lamps, candle lamps, torches etc. A special type of bi-pin cap for discharge lamps is also produced, but not the type used in fluorescent lamps. Lamp Caps has a very small trade in other products unconnected with electric lamps.

522. We have obtained from Lamp Caps its trading results for a number of years, and its forecasts for a year or two ahead. We are therefore able to indicate the results it has achieved both before and since it acquired early in 1967 Lamp Presscaps' interests in the manufacture of vitrited caps. We can also show how the results and current forecasts for the period since the merger compare with the forecasts made at the time the merger was arranged.

523. We summarise in the following table the trading results for the last three financial years ended 31st March 1968:

	1965/66		1966/67*		1967/68	
VITRITED CAPS—quantity	415 m.		476 m.		599 m.	
SALES VALUE	(£'000)	(%)	(£'000)	(%)	(£'000)	(%)
Parents	466	43·7	598	44·5	887	46·1
Other home customers	355	33·3	475	35·3	527	27·4
Exports	246	23·0	272	20·2	510	26·5
Total Sales	1,067	100·0	1,345	100·0	1,924	100·0
Less 'normal' costs	953	89·3	1,196	88·9	1,812	94·2
	114	10·7	149	11·1	112	5·8
Less revenue expenses of integration	—	—	9	0·7	70	3·6
TRADING PROFIT†	114	10·7	140	10·4	42	2·2
AVERAGE CAPITAL EMPLOYED	598		731		920	
PERCENTAGE RETURNS ON CAPITAL		19·1		19·2		4·6

* Integration of production of vitrited caps began three-quarters of the way through 1966/67.
† From 1967/68, for up to 10 years, BLI is entitled to a first charge on the profits—to be called a 'service fee'—in compensation for its loss of Lamp Presscaps' profits.

524. Integration is expected to be completed during this current year, 1968/69. We compare below for the first full year after integration 1967/68 the out-turn for that year with the original estimate of the trading results for that year, as estimated in early 1967; the shortfall in both production and profits when compared with the estimates came about through under-estimation of the difficulties that would arise from the transfer and integration of manufacturing methods that were, to some extent, dissimilar. We also compare the original estimate (early 1967) and the revised estimate at current cost and price levels (May 1968) for 1969/70, the first full year after the integration has been completed; the alterations in sales values in the revised estimates reflect not only price increases but also anticipated changes in the proportions of types likely to be required and in the proportions of trade in the different sectors of the market. The estimates do not take into account capital expenditure now planned, but which was not contemplated at the time of the merger.

	1967/68		1969/1970	
	Estimate Jan. 1967	Actual	Estimate Jan. 1967	Revised Estimate May 1968
VITRITED CAPS: Quantity	674 m.	599 m.	645 m.	645 m.
SALES VALUE:	(£'000)	(£'000)	(£'000)	(£'000)
Parents	856	887	756	884
Other home customers	636	527	742	602
Export	529	510	443	544
Total sales	2,021	1,924	1,941	2,030
Less 'normal' costs	1,802	1,812	1,669	1,812
	219	112	272	218
Less revenue expenses of integration	61	70	—	—
TRADING PROFIT [LOSS]	158	42	272	218
AVERAGE CAPITAL EMPLOYED	1,050	920	1,200	1,200
PERCENTAGE RETURNS ON:	(%)	(%)	(%)	(%)
Sales	7·8	2·2	14·0	10·7
Capital	15·0	4·6	22·7	18·2

525. Sales to parents are at 'cost plus 5 per cent'. We understand that the definition of 'cost' for this purpose is what we have referred to in the above tables as 'normal' cost before charging the special expenses attributable solely to the integration. On the assumptions that

(i) the sales/capital ratio is similar for sales to all customers, and

(ii) the special expenses may be apportioned pro rata to 'normal' costs

the profits may be restated as follows:

	Return on sales		Return on capital	
	Parents	Other customers	Parents	Other customers
	(%)	(%)	(%)	(%)
(a) 'NORMAL' PROFITS				
1965/66	4·8	15·3	8·4	27·3
1966/67	4·8	16·2	8·8	29·7
1967/68 estimate:				
(January 1967)	4·8	15·3	9·2	29·4
actual	4·8	6·8	10·0	14·1
1969/70 estimate:				
(January 1967)	4·8	19·9	7·7	32·2
revised estimate (May 1968)	4·8	15·4	8·0	26·0

	Return on sales		Return on capital	
	Parents (%)	Other customers (%)	Parents (%)	Other customers (%)
(b) TRADING PROFITS (after charging integration etc. expenses)				
1966/67	4·1	15·5	7·5	28·4
1967/68 estimate:				
(January 1967)	1·6	12·4	3·0	23·9
actual	1·0	3·2	2·1	6·7

Lamp Presscaps Ltd.

526. Lamp Presscaps, a wholly-owned subsidiary of BLI, is now the sole United Kingdom manufacturer of bi-pin caps for fluorescent lamps. It also produced about 30 per cent of the total production of vitrited caps in this country until it sold this part of its business to Lamp Caps in January 1967.

527. For vitrited caps, the prices charged to BLI were comparable with the 'parents' prices at which BLI could have purchased them from Lamp Caps. Prices to other customers were said to have been related roughly to quantities; differences between the prices charged by Lamp Presscaps and Lamp Caps were only small, and in the months before the transfer of production to Lamp Caps, prices were identical.

528. The main customers for bi-pin caps are BLI and Osram, who purchase the bulk of bi-pin caps sold by Lamp Presscaps in the United Kingdom (Philips obtains its requirement of these caps from NV Philips). The bi-pin caps purchased by BLI are used in its fluorescent lamp factory which is adjacent to Lamp Presscaps' factory.

529. We have obtained the following summaries of Lamp Presscaps' trading results both before and since the transfer of its vitrited cap interests, including the budget for this current year, thus covering a period of four years to 31st March 1969:

	1965/66	1966/67*	1967/68	1968/69
BI-PIN CAPS: Quantity	n/a	n/a	Estimate 82 m.	Budget 101 m.†
SALES VALUE:	(£'000)	(£'000)	(£'000)	(£'000)
Bi-pin	301	332	335	454
Vitrited	684	567	—	—
	985	899	335	454
PROFIT	104	89	26	34
AVERAGE CAPITAL EMPLOYED	588	569	say 350	say 350
PERCENTAGE RETURNS ON:	(%)	(%)	(%)	(%)
Sales	10·6	9·9	7·8	7·5
Capital	17·7	15·6	7·4	9·7

The terms of the transfer allow for the payment to Lamp Presscaps of a preferential share of Lamp Caps' profits for a period of years, as compensation for Lamp Presscaps' loss of profits on its previous trading in vitrited caps.

* The transfer of vitrited caps production to Lamp Caps was effective from January 1967, so the vitrited caps sales relate to about nine months only.
† Including budgeted exports of 26 m. bi-pin caps.

Unit costs

530. We obtained from some of the manufacturers estimates of their respective unit costs for certain popular types of reference lamps. We do not propose to give any details of the estimates supplied by the individual manufacturers. However, from our examination of the various estimates, and taking account of the difficulties encountered by the manufacturers in calculating them, we have prepared the figures set out in Schedule 5 which should be regarded as giving no more than a rough indication of typical unit costs in 1967 for 60-watt and 100-watt GLS lamps, coiled-coil and single-coil, main brands and second brands. We also show for comparison some corresponding details for 1948, prepared from such information as is now available.

Comparison of Reference Trading Results
(For the two financial years ended on or before 31st March 1966 and 1967)

Schedule I

	BLI (Year end 31st March)					OSRAM (Year end 31st March)					PHILIPS (Year end 31st December)				
				Discharge					Discharge					Discharge	
	Total	Filament	Total	Fluor-escent	Mercury and sodium	Total	Filament	Total	Fluor-escent	Mercury and sodium	Total	Filament	Total	Fluor-escent	Mercury and sodium
1965/66	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)
Net sales	11,381	6,475	4,906	3,897	1,009	4,898	3,277	1,621	860	761	4,724	2,023	2,701	1,133	1,568
Profit	1,148	472	676	524	152	614	348	266	123	143	491	91	400	133	267
Average capital employed:															
Historic cost basis	8,454	4,971	3,483	N.A.	N.A.	2,796	1,736	1,060	N.A.	N.A.	—	—	—	—	—
Revaluation basis	—	—	—	—	—	—	—	—	—	—	2,433	1,146	1,287	N.A.	N.A.
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Percentage return on sales	10·1	7·3	13·8	13·4	15·0	12·5	10·6	16·4	14·4	18·7	10·4	4·5	14·8	11·7	17·0
Percentage return on capital	13·6	9·5	19·4	N.A.	N·A.	21·9	20·0	25·1	N.A.	N.A.	20·2	8·0	31·1	N.A.	N.A.
1966/67	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)
Net sales	11,138	6,232	4,906	3,793	1,113	5,205	3,431	1,774	918	856	5,229	2,149	3,080	1,286	1,794
Profit	1,076	317	759	544	215	573	373	200	115	85	376	68	308	51	257
Average capital employed:															
Historic cost basis	9,155	5,354	3,801	N.A.	N.A.	3,198	1,986	1,212	N.A.	N.A.	—	—	—	—	—
Revaluation basis	—	—	—	—	—	—	—	—	—	—	2,813	1,210	1,603	N.A.	N.A.
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Percentage return on sales	9·7	5·1	15·5	14·3	19·3	11·0	10·9	11·3	12·5	10·0	7·2	3·1	10·0	4·0	14·3
Percentage return on capital	11·8	5·9	20·0	N.A.	N.A.	17·9	18·8	16·5	N.A.	N.A.	13·4	5·6	19·2	N.A.	N.A.

Comparison of Costs of Reference Trading *Schedule 2.*

(For the two financial years ended on or before 31st March 1966 and 1967)

	BLI (Year end 31st March)					OSRAM (Year end 31st March)					PHILIPS (Year end 31st December)				
			Discharge					Discharge					Discharge		
	Total	Filament	Total	Fluor-escent	Mercury and sodium	Total	Filament	Total	Fluor-escent	Mercury and sodium	Total	Filament	Total	Fluor-escent	Mercury and sodium
	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)
1965/66															
VALUE															
Manufactured lamps	6,535	3,891	2,644	2,168	476	2,920	2,057	863	478	385	1,650	758	892	275	617
Bought out finished lamps	481	186	295	126	169	281	131	150	72	78	1,392	595	797	475	322
'Factory' cost	7,016	4,077	2,939	2,294	645	3,201	2,188	1,013	550	463	3,042	1,353	1,689	750	939
Research and development	449	252	197	109	88	181	124	57	31	26	105	50	55	19	36
Selling, distribution and administration	2,768	1,674	1,094	970	124	902	617	285	156	129	1,086	529	557	231	326
Total cost	10,233	6,003	4,230	3,373	857	4,284	2,929	1,355	737	618	4,233	1,932	2,301	1,000	1,301
PERCENTAGES OF NET SALES VALUE	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Manufactured lamps	57·4	60·1	53·9	55·6	47·2	59·7	62·8	53·3	55·6	50·5	34·9	37·5	33·1	24·3	39·3
Bought out finished lamps	4·3	2·8	6·0	3·3	16·8	5·7	4·0	9·2	8·4	10·2	29·5	29·4	29·5	41·9	20·6
'Factory' cost	61·7	62·9	59·9	58·9	64·0	65·4	66·8	62·5	64·0	60·7	64·4	66·9	62·6	66·2	59·9
Research and development	3·9	3·9	4·0	2·8	8·7	3·7	3·8	3·5	3·6	3·4	2·2	2·4	2·0	1·7	2·3
Selling, distribution and administration	24·3	25·9	22·3	24·9	12·3	18·4	18·8	17·6	18·0	17·2	23·0	26·2	20·6	20·4	20·8
Total cost	89·9	92·7	86·2	86·6	85·0	87·5	89·4	83·6	85·6	81·3	89·6	95·5	85·2	88·3	83·0
1966/67	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)	(£'000)
VALUE															
Manufactured lamps	6,402	3,712	2,690	2,140	550	3,148	2,156	992	468	524	2,056	961	1,095	370	725
Bought out finished lamps	534	327	207	69	138	265	98	167	122	45	1,635	585	1,050	610	440
'Factory' cost	6,936	4,039	2,897	2,209	688	3,413	2,254	1,159	590	569	3,691	1,546	2,145	980	1,165
Research and development	387	184	203	97	106	187	124	63	32	31	145	71	74	26	48
Selling, distribution and administration	2,739	1,692	1,047	943	104	1,032	680	352	181	171	1,017	464	553	229	324
Total cost	10,062	5,915	4,147	3,249	898	4,632	3,058	1,574	803	771	4,853	2,081	2,772	1,235	1,537
PERCENTAGES OF NET SALES VALUE	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Manufactured lamps	57·5	59·6	54·8	56·4	49·4	60·5	62·8	55·9	51·0	61·3	39·3	44·8	35·6	28·7	40·5
Bought out finished lamps	4·7	5·2	4·2	1·8	12·4	5·1	2·9	9·4	13·3	5·2	31·3	27·2	34·1	47·5	24·5
'Factory' cost	62·2	64·8	59·0	58·2	61·8	65·6	65·7	65·3	64·3	66·5	70·6	72·0	69·7	76·2	65·0
Research and development	3·5	3·0	4·1	2·6	9·5	3·6	3·6	3·6	3·5	3·6	2·8	3·3	2·4	2·0	2·7
Selling, distribution and administration	24·6	27·1	21·4	24·9	9·4	19·8	19·8	19·8	19·7	19·9	19·4	21·6	17·9	17·8	18·0
Total cost	90·3	94·9	84·5	85·7	80·7	89·0	89·1	88·7	87·5	90·0	92·8	96·9	90·0	96·0	85·7

Performance Ratios

Year ended on or before 31st March 1966

Schedule 3

Ratio number		BLI Total	BLI Filament	BLI Discharge	OSRAM Total	OSRAM Filament	OSRAM Discharge	PHILIPS Total	PHILIPS Filament	PHILIPS Discharge
	PRIMARY RATIOS									
1	Profit: average capital employed	13·6%	9·5%	19·4%	21·9%	20·0%	25·1%	20·2%	8·0%	31·1%
2	Profit: sales	10·1%	7·3%	13·8%	12·5%	10·6%	16·4%	10·4%	4·5%	14·8%
		Times multiplied to give sales (or total costs in the case of creditors)								
3	Sales: average capital employed	1·35	1·30	1·41	1·75	1·89	1·53	1·94	1·77	2·10
	SECONDARY RATIOS									
4	Sales: fixed assets	2·91	2·97	2·84	4·36	4·84	3·65	4·41	3·75	5·09
5	Sales: properties	6·72	7·44	5·95	27·06	31·51	21·05	9·50	8·50	10·50
6	Sales: plant, fittings and vehicles	5·14	4·95	5·42	5·21	5·72	4·42	8·20	6·70	9·90
7	Sales: net current assets	2·50	2·32	2·80	2·92	3·09	2·63	3·47	3·34	3·57
	CREDIT TAKING									
8	Sales: debtors	4·27	4·44	4·07	4·15	4·15	4·15	4·28	4·11	4·42
9	Equivalent *in weeks*	12·2	11·7	12·8	12·5	12·5	12·5	12·1	12·6	11·8
10	Total costs: creditors	5·69	6·39	4·94	4·55	4·40	4·91	4·69	4·78	4·62
11	Equivalent *in weeks*	9·1	8·1	10·5	11·4	11·8	10·6	11·1	10·9	11·3

Note: The ratios (times multiplied to give sales) are compared with sales = 1·0. That is, for example, the less by value of fixed assets in any instance, the higher the sales ratio shown.

Performance Ratios *Schedule 4*

Year ended on or before 31st March 1967

Ratio number		BLI Total	BLI Filament	BLI Discharge	OSRAM Total	OSRAM Filament	OSRAM Discharge	PHILIPS Total	PHILIPS Filament	PHILIPS Discharge
	PRIMARY RATIOS									
1	Profit: average capital employed	11·8%	5·9%	20·0%	17·9%	18·8%	16·5%	13·4%	5·6%	19·2%
2	Profit: sales	9·7%	5·1%	15·5%	11·0%	10·9%	11·3%	7·2%	3·1%	10·0%
		Times multiplied to give sales (or total costs in the case of creditors)								
3	Sales: average capital employed	1·22	1·16	1·29	1·63	1·73	1·46	1·86	1·78	1·92
	SECONDARY RATIOS									
4	Sales: fixed assets	2·83	2·80	2·87	4·28	4·80	3·53	3·27	3·12	3·38
5	Sales: properties	6·69	7·20	6·14	27·98	32·99	21·63	6·80	8·80	5·80
6	Sales: plant, fittings and vehicles	4·91	4·58	5·39	5·05	5·62	4·22	6·30	4·80	8·00
7	Sales: net current assets	2·13	1·99	2·35	2·63	2·70	2·50	4·31	4·12	4·46
	CREDIT TAKING									
8	Sales: debtors	3·70	3·92	3·46	3·83	3·84	3·81	4·12	3·94	4·26
9	Equivalent *in weeks*	14·0	13·3	15·0	13·6	13·5	13·7	12·6	13·2	12·2
10	Total costs: creditors	6·38	6·80	5·87	4·53	4·58	4·43	4·34	4·32	4·35
11	Equivalent *in weeks*	8·1	7·6	8·9	11·5	11·3	11·7	12·0	12·0	12·0

Note: The ratios (times multiplied to give sales) are compared with sales=1·0. That is, for example, the less by value of fixed assets in any instance, the higher the sales ratio shown.

Estimated unit costs of 60-watt and 100-watt, pearl, GLS filament lamps *Schedule 5*

	60-watt				100-watt			
	Factory cost	Selling and distribution	Total cost	Normal retail price*	Factory cost	Selling and distribution	Total cost	Normal retail price*
	Pence each	*Pence each*	*Pence each*	*Pence each*	*Pence each*	*Pence each*	*Pence each*	*Pence each*
1948								
(Costs extracted from 1951 Report, table 9)								
Main brands (ELMA companies—weighted average):								
Coiled-coil	7·23			18·00	8·64			22·00
Single-coil	6·28			15·00	7·45			21·00
Second brands: single-coil:								
A Controlled Company (the lowest)	5·77			11·00 to	6·24			13·00 to
An independent (the lowest)	6·30			15·00	7·28			20·00
1967								
ELIC companies								
Main brands:								
Coiled-coil	6·40	3·10	9·50	18·50	6·60	3·20	9·80	18·50
Single-coil	6·00	3·00	9·00	18·50	6·10	3·10	9·20	18·50
Second brands: single-coil	5·80	0·80	6·60	13·69	5·90	0·90	6·80	17·56
The Controlled Companies: single-coil (ranking as second brands)	6·00	1·00	7·00	13·69	6·10	1·00	7·10	17·56

* Excluding purchase tax.

CHAPTER 11

The Submissions of the Industry

I: The Submissions of the Principal Manufacturers

531. As we have said in paragraph 5, each of the four principal manufacturers, namely, BLI, Crompton, Osram and Philips, was notified in June 1967 of certain matters, in so far as these applied to each of them, which it might be contended operated or might be expected to operate, against the public interest. Crompton's reply was limited to comments, of which we have taken account, on certain of the facts relating to these matters. The representations made by BLI, Osram and Philips, respectively, in writing and at subsequent hearings, on the particular matters which applied to all three of them, are summarised under appropriate headings in paragraphs 532–604. On most of these matters the representations made by all three tended to be similar in some respects. We first set out summaries of BLI's representations under each heading, followed by summaries of such of the representations of Osram and Philips as differed from, or were additional to, those of BLI. BLI's representations on certain other matters which applied only to it, as the dominant supplier, are summarised in paragraphs 605–629, as are some of its comments on certain of the observations of distributors and users included in chapters 8 and 9 which may be critical of the arrangements of the principal manufacturers. All the representations were made before Philips introduced its new trading arrangements on 1st March 1968, and the trading arrangements referred to in this chapter are accordingly those operated by BLI, Osram and Philips between 1st April 1967 and 1st March 1968 (see appendix 8, table 6).

Competition in the supply of reference type electric lamps since 1951

532. *BLI* says that competition in reference goods is intense, and that the principal manufacturers are struggling unremittingly to increase their sales. It suggests that the relative progress or decline of the market shares of the different manufacturers demonstrates the intensity of competition. It claims that competition has increased since 1951, despite the factors which might suggest that it has diminished; for example, the acquisitions and take-overs which have reduced the number of both main brand and previously independent second brand companies, the fact that there are now only two independents producing GLS lamps and the fact that, whereas in 1951 Thorn was an outsider offering different discounts from ELMA members it is now, through BLI, an ELIC member offering in main brands the same prices and discounts as other ELIC members. BLI says that the extent of competition is not determined by the number of competitors but by the effectiveness of the competition, otherwise any merger would, ipso facto, be 'anti-competitive'. A merged concern, by economies of scale in manufacture and distribution, may not, in a period of general inflation, reduce prices and may be found to be selling at the same prices as its competitors; but the level at which price competition occurs may be lower than would be the case had the merger not taken place. BLI says that it cannot stress too strongly the importance it attaches to containing and reducing costs, both in holding down prices of reference lamps in the home market and in retaining and expanding export

markets. It claims that the price record of reference lamps demonstrates how competition on costs between the principal manufacturers has held down market prices and that this competition will be further sharpened by the progress of rationalisation made possible by the formation of BLI.

533. BLI says that acquisitions of independents by the principal manufacturers have increased competition: the independents have been acquired not with the purpose of closing them down but with the object of giving the buyers concerned direct stakes in the second brand market. With the resources of their parent companies behind them, these companies are now in a better position to compete than if they had remained independent, and, with the benefit of the parents' know-how and manufacturing facilities, the effectiveness of their competition has been increased because of lower costs.

534. BLI accepts that after the so called 'price war' of 1956, when Thorn joined ELIC, competition in the main brand market ended for a time. But with the ending of the ELIC trading structure at the end of 1959 all questions of price, discounts and trading policies have been matters for manufacturers to decide individually. BLI adopted a radically altered trading structure in April 1967. The re-casting of a trading structure is a major upheaval and would not be contemplated without clear evidence that the existing structure was operating unsatisfactorily. Matching of terms is the norm and is enforced by competition where there is little or no product differentiation and where the principal brands have similar high reputations with consumers. Nowadays, no principal manufacturer could afford to operate a structure less favourable than that operated by any other principal manufacturer. In 1951, Thorn's standing with the trade was not as high as that of the ELMA members, who by exclusive dealing agreements had access to the main distributive outlets, and Thorn was compelled to grant higher discounts in order to get distribution. Today, the level of discounts is not set by agreement but by competition and their similarity is also set not by agreement but by competition. BLI concludes by noting the activities of ELMA which in 1951 restricted competition, for example, quotas; exclusive dealing and aggregated rebates; the rule which limited supply by members to types agreed by ELMA; agreed common prices and discounts at each stage of supply. These activities have no parallels in the present situation. In addition, the abolition of resale price maintenance in April 1967 has increased competition at the wholesale level, and as the bulk of BLI's main brands are sold to wholesalers, this has meant a considerable increase in competition. In short, since 1951 the whole industry and the trade in reference lamps has been opened up to competition whereas in 1951 competition was between ELMA and independents.

535. *Osram* suggests that it is symptomatic of a highly competitive market that a manufacturer achieving increases in efficiency of production resulting in a progressive reduction in the real value of prices will have an almost constant share of the market. Prices of lamps have been stable since 1949 despite the overall inflation of prices generally by about 75 per cent, and Osram's costs of production and its selling prices in 1949 and in each year of the period 1963–67 show that, in monetary terms, costs of production had decreased by about 12 per cent over the 17 years. The cost of materials in monetary terms is now only marginally different from the cost in 1949 due mainly to increases in the efficiency of the suppliers. The overheads in monetary terms are about 10 per cent less, on average, per lamp today than in 1949. As production has doubled this means that over-

heads per lamp, in real terms, although they might have been expected to decrease to some extent consequent on the higher production, are, in fact, little more than half what they were in 1949, which, Osram claims, indicates the considerable improvements in efficiency. The biggest fall in costs has been in the cost of labour; in monetary terms labour per unit is about half what it was in 1949 although the average price of labour is $2\frac{1}{4}$ times what it was in 1949. Osram's total sales of reference lamps over the past six years have increased by about four per cent per annum in monetary terms, which represents approximately a similar increase in volume and corresponds closely to the increase in the gross national product. Osram refers to the continuous growth in the second brand market and says that an exercise carried out by ELIC covering sales in July and August 1967 indicated that the second brand business accounted for about half the total sales of GLS lamps (including candle and other decorative types), and thus constitutes severe competition with main brand business. The figures were a strong indication that the size of the cheap lamp market in relation to the total home market had grown compared with 1951, and this was primarily because of the growth of sales of lamps by grocery and supermarket outlets and of sales of own brands by electricity boards.

536. Osram asserts that the competition in cheap lamps from within its own organisation and from the other principal manufacturers is just as effective as the competition formerly offered by independent manufacturers, in fact, more so. While Osram's second brand salesmen do not knowingly sell against the parent company, they are competing with the other manufacturers' second brands. In so far as a buyer was persuaded to buy a second-brand lamp in place of a main-brand lamp, it was an attack on the whole of the main brand market, and this was evidenced by Osram's claim that the cheap lamp market has grown since 1951.

537. *Philips* suggests that any decline in the number of groups or companies since 1951 is outweighed by the great increase in competition between the groups or companies which now comprise the industry. It suggests that the Commission should look at market shares by brands as well as by producers because of the goodwill which attaches to brands. Although BLI might have more than one-third of the total home market in reference lamps on any basis, it is subjected to considerable competition in some sectors, in particular, the sodium and mercury discharge lamp sector where its share is less than that of some other suppliers. Philips has a larger share than BLI in this sector and is determined to maintain its lead. Philips has increased its share of the total main brand market threefold since 1951 and this demonstrates the effects of the removal of the ELMA sales quotas and the increase in competition over the last fifteen years.

538. Philips maintains that it is misleading to include Luxram's and Kingston's sales figures with those of Philips Electrical as the managements of Luxram and Kingston have considerable autonomy. The competitive position of the two companies was improved by joining the Philips Group by the advantages in prices of components and the prospects of substantial inter-trading within the Group. Their competitive position had been strengthened by the abandonment by ELMA of exclusive dealing and aggregated rebates, and these changes must also have assisted other small suppliers.

539. As regards competition in the cheap lamp sector of the market, Philips suggests that the general disappearance of single-coil lamps from the main brand market has accentuated the difference between main brands and second brands, which are all single coil. Competition in the cheap lamp sector is no longer only

between the Controlled Companies and independents, but also exists between the major suppliers and the Controlled Companies. In addition, Woolworth now faces increased competition in the retail market through the increase in the number of other retail chains which have taken up the sale of lamps.

540. Philips maintains that competition in the range of products offered has increased since 1951, when no new product could be introduced by an ELMA member without the agreement of the other members. The rule ceased to bind Philips when it left ELMA in 1955 and, whatever may have been the effect of the rule, there can be no doubt about the number, importance and speed of new and competitive technical developments in the reference field over the past twelve years. Competition in service was intense in 1951 and is still intense. The technical innovations have made it increasingly necessary to go out and sell new ideas to users. Patents no longer restrict competition and are not today of particular significance in the reference field.

541. As a result of competition, the relative strength and market shares of the major manufacturers have changed and continue to change; and the markets in which all manufacturers are competing are no longer distinct. Philips' competitive activities are limited only by its production capacity at any given time. It maintains that the assimilations and take-overs which have taken place in the industry are not consequences of restrictions adopted by the major manufacturers. With fewer companies in the industry, mechanisation and economies of scale have become and continue to become increasingly important. Finally, Philips considers that the entry into the United Kingdom market of technically and financially strong foreign concerns is an ever present possibility.

Recommended prices

542. *BLI* suggests that since resale price maintenance only ended on 1st April 1967 it is too early to assess the extent to which distributors are following its recommendations. It says that many wholesalers are already giving discounts on some parts of their business that are higher than those recommended, and that this trend may increase, particularly for local authority and trade user business. Generally, lamps are not attractive merchandise to either wholesalers or retailers, and users tend to purchase only to meet immediate requirements; this militates against any general departure from the recommended terms or the retail list prices. In addition, the general public is not particularly price conscious as regards lamps, and few retailers would be likely to cut their margins. BLI says that if there were no recommended resale prices, the likelihood is that retail prices would rise. While not accepting that the present system leads to undue rigidity, high costs in distribution and artificially high prices to consumers, BLI suggests that if that proposition were true, the position would be no different if prices and discounts were not recommended. BLI sells direct not only to special users and wholesalers but also to a wide range of retailers and users, and would need to lay down for its own internal purposes terms on which it would be prepared to sell to all the various categories of customers to whom its wholesalers sell. BLI knows of no way by which it could be prevented from publishing its terms for the information of these customers, it would have to keep to these terms as it would be impracticable for it to compete with its wholesalers in the field in which wholesalers sell (although the wholesalers can compete with BLI). Wholesalers would set their terms by BLI's, and the position would therefore be no different in the absence of any

recommendations. If BLI was not permitted to recommend resale prices and discounts, it would not vary the terms on which it was prepared to sell direct, though it would have to relate its terms to trade prices and not retail list prices. In establishing those terms, it would have regard to the same considerations and the same objectives as under the present system.

543. BLI's trade structure is based on two objectives. The first is to obtain adequate distribution; to achieve this, distributors should receive sufficient rewards to induce them to perform the services required of them. The second objective is to ensure as far as possible that business that can be serviced most economically by wholesalers is handled by them and not by BLI. BLI explains that the type of business that can be handled most economically by wholesalers is that of the small retailers and small trade users, and BLI's representatives are constantly encouraging these customers to buy from its wholesalers; in some cases, they take the orders and give them to the wholesalers to deal with. The type of business where BLI considers the wholesalers can play little part is that of the very large trade users who normally buy direct, at approximately wholesale terms. Terms to users, local authorities and retailers must, accordingly, be such as will result in reasonable prices to those customers and at the same time enable wholesalers to handle the business and obtain an acceptable profit on it. BLI accepts that any trade structure laid down by a manufacturer will produce some rigidity, but claims that in the absence of resale price maintenance this is not a serious consideration. There is nothing to prevent a low-cost wholesaler from taking a lower margin where he sees fit, and there is nothing in BLI's structure which would operate as a disincentive to him. The structure could not be said to make for high costs in distribution unless it discouraged purchasers from ordering in economical quantities and BLI does not consider that this is the case. Much of the trade in lamps is done in small quantities involving the breaking of bulk. BLI has made efforts to reduce distribution costs by encouraging large orders, and in April 1967 it introduced quantity discounts for wholesalers, in addition to the quantity grading which had previously applied to electrical contractors and retailers. It also laid down minimum sale orders for popular types of filament lamps and fluorescent lamps, but these were considered by the trade to be too exacting in some respects, and it was obliged to modify them in October 1967. BLI concludes by suggesting that the pace of change cannot be forced, and that it cannot improve economical ordering beyond the reasonable capacity of customers to comply.

544. *Osram* says it has no experience of a situation where there are no recommended prices and discounts, but its policy is to recommend prices and discounts which, as far as it can estimate, are fair both to the consumer and the trade; and it thinks that in a competitive industry natural market forces will effect an adjustment if its assessment is marginally wrong. If the effect of its policy is to keep prices higher than they would be in the absence of recommended prices and discounts, this can be so only marginally and it submits that the practices are nevertheless in the public interest. It says that it is a matter of considerable public importance that there should be available to the general public extensive sources of supply. At the present time, lamps can be bought from electrical retailers, hardware stores, supermarkets, grocery shops, etc; this means that any householder who wants a lamp at short notice can obtain it with the minimum of difficulty. The sale of lamps by many retailers is a very unimportant part of their business and unless they are allowed a reasonable margin of profit, there is a real danger that they will cease to stock lamps and the public may be put to considerable inconvenience. In 1951 the basic retail discount was 20 per cent and it is now

30 per cent; the basic wholesale discount was 33⅓ per cent and is now 40½ per cent. Since prices have remained virtually stable and there has been a 75 per cent general inflation of prices since 1951, the real cost of the distribution services to the public is less than in 1951.

545. The practice of recommending list prices is one which the retailer likes and to some extent his wishes have to be respected. The retailer likes recommended retail prices because it gives him an indication of the level at which he can sell; it gives him an indication of where he can cut the price and compete with other retailers; and finally, it is simpler for him to buy at a list price less a discount than at a whole series of net prices. So far, there was very little evidence of any price cutting of Osram lamps by retailers, but there was continued competition between wholesalers. It also suits Osram to have recommended list prices, it is simpler to have one catalogue and a series of discounts than a series of net prices for the very large range of lamps sold. As to whether adequate distribution might be achieved if lamps were offered to all comers at the same prices, related as necessary to the size of order, total annual purchases, or both, Osram says that it could well be that, on that basis, distribution costs might be reduced, but the discount allowed to wholesalers takes account of the services they perform, and the same applies to the retailers.

546. *Philips* says that until 1967 resale price maintenance was a condition of sale of main brands; Luxram and Kingston had no such conditions of sale. Neither the main brand companies, Philips Electrical and Stella, nor Kingston and Luxram, then or now, experienced price cutting at the retail shop level; this is not due to any action on the companies' part. Philips publishes, as a price guide, the prices and discounts off list prices at which it is prepared to sell direct to the different classes of buyers. None of the companies in the group recommends retailers to sell at published list prices nor do they publish discounts to be allowed by distributors. Philips publishes retail list prices for the following reasons. The Philips catalogue contains over 2,000 different lamps, and for all but the most specialised types it is convenient to print a price in the catalogue. It is convenient to the retailer if the price in the catalogue is the one Philips believes he is likely to want to charge, leaving him to make any adjustments he likes rather than have a basic price to which he would have to add a mark-up. The retailer can show customers the catalogue without disclosing his gross margin. It would complicate matters for a distributor to calculate a mark-up or a discounted basic price rather than simply to discount a list price. The main advantage to Philips in the published retail list prices is that it can place its catalogues in the hands of all types of buyers, who will see the list prices at or off which they know they can buy. Philips suggests several reasons why there is not more price cutting at the retail level. The difference in price between the supermarket/chain store cheap lamp and a main-brand lamp is substantially greater than any likely price cut of a main brand. Electrical retailers do not regard existing gross margins on main brands as particularly attractive, and many radio shops have given up stocking lamps as they found the trade unattractive. Philips thinks it likely that electrical retailers probably consider that their trade would not be significantly increased by a cut of a penny or twopence off main brands. Retailers of cheap lamps generally charge a price which yields them at least as large a percentage gross margin as is yielded by main brands, but they offer no services.

547. Although Philips sells some lamps direct to retailers, contractors and users, the margins achieved by wholesalers are determined primarily by competition

between wholesalers and there is nothing to prevent them underselling Philips; their ability to do so is helped by their knowledge of the prices at which Philips would sell direct to particular buyers. Philips believes that wholesalers often do supply their customers at prices which are lower than those at which Philips would supply direct. Generally, Philips maintains that none of the companies in the Group does anything which makes for undue rigidity in distribution or raises costs of distribution or prices to the consumer.

The practice of basing the recommended prices and discounts on the customer's total purchases of all brands of lamps from all sources

548. *BLI* says that this practice applies to three categories of customers for main brands, namely, wholesalers, trade users and electricity boards; the practice is of long standing in the industry, and BLI does not consider that it makes either for undue rigidity or high costs in the distributive trade. It sees as irrelevant the fact that the recommended terms are related to total purchases. Manufacturers can apply one of two principal bases in fixing their terms—by status or by quantities purchased from the supplier. As regards the status system, BLI says that it is immaterial what criteria are applied, the position would be no different if, for example it classified wholesalers as 'large', 'medium' and 'small'. The grant of status discounts to resellers is ordinary commercial practice, and is not uncommon in the case of sales to trade users. BLI suggests that in the lamps industry, where different makes are interchangeable, a status system of discounts based on total purchases is the only practicable method of differentiation. Wholesalers could not live on one brand alone and would have just cause for complaint if BLI sought to relate their terms to purchases from BLI alone. If BLI sought to apply the same principle to users and electricity boards, it would be open to the charge of limiting freedom of choice.

549. *Osram* says that as far as status terms to wholesalers are concerned lamps are bulky goods, and a wholesaler's order for £50–£100 from a manufacturer is normally regarded as a substantial order. If a system of discounts based on actual sales was adopted the large wholesaler would be in a position to negotiate better terms than the small wholesaler and might be able to reduce slightly the manufacturer's prices; he would then be likely to pass on some of these lower prices to the retailers, but it would be very doubtful whether the retailers would pass on these reductions to the general public. Osram says there is no reason to suppose that the total cost of distribution would be reduced by reducing the price paid to the manufacturer—the only result would be a reduction in the manufacturer's profit margin.

550. *Philips* points out that the extent to which the status system is followed within the Group is limited to a part only of main-brand business. It is not followed in the direct sales to certain large customers which account for about a quarter of its total sales of main brand reference lamps, or in the substantial sales of discharge lamps. As regards filament and fluorescent lamps other than those sold direct to certain large customers, the practice is subject to certain modifications. Philips has for some time granted confidential terms to a few wholesalers, it says that other manufacturers have on occasions pursued a similar policy, but Philips has not necessarily matched their generosity if the buyer's purchases from it were small, and vice versa.

551. As to why published discounts for main brands are related to overall purchases to the extent that they are, Philips says that the practice is historical and stems from the ELMA days, and so long as resale price maintenance applied it had to notify ELIC of any new discount classification. This made the operation of a completely new customer classification 'administratively inconvenient', and it was natural for Philips to continue to use the ELIC wholesaler classification adopted by the market leaders. Luxram's and Kingston's discounts are determined on an ad hoc and compromise basis—by reference to size of order, terms offered by competitors, negotiating skill of buyer—and this system is removed only in degree from the system increasingly operated by Philips in respect of its main brands.

The practice of ELIC of compiling and circulating to members a list of trade users, graded according to total purchases of all brands of lamps from all sources

552. *BLI* says that the last list, as such, was circulated in 1963, and ELIC now merely circulates lists relating to take-overs, changes of name and the like. Members continue to inform ELIC each month in arrears of changes in their terms, whether generally or to particular trade users, and each month ELIC circulates any such changes of which it is advised. The value of this arrangement to BLI is that it saves obtaining the information in a more unreliable way through its sales force. With so much more business now going through wholesalers, an accurate list of graded users is no longer of value. BLI keeps its own lists reasonably up to date, as a broad guide. As regards the status grading of wholesalers, ELIC continues to collect information from members about purchases by wholesalers, and BLI says that 'once a year we compare total purchases which enables us to see whether the main wholesalers are in the right brackets'. BLI agrees that these arrangements encourage uniformity of trading, but says that without them the manufacturers would arrive at uniformity just the same. It cannot envisage a stage where the wholesalers were getting different discounts from different manufacturers; sheer competition would drive them to some sort of parity. 'We have had this many times with the large users, somebody puts up their discount and in almost no time somebody else is round and they get the same from everybody.'

553. *Osram* says that, with a system of status discounts for trade users, information as to their total purchases must be available to the manufacturers either from the trade users themselves or from other sources. ELIC's last published lists of users, with subsequent amendments, have been a convenient method of supplying manufacturers with the relevant details. The information is quite useful to Osram, but offers very little guidance today to its distributors, who tend to settle their own discounts in relation to dealings with users.

554. *Philips* maintains that the ELIC information arrangements relating to trade users are of very limited significance as it does little main brand business with trade users on the lists. Such users generally buy Philips' lamps from wholesalers, and the lists do not inhibit it from seeking more direct business from such users should it wish to do so. The lists have a certain use as a mailing list which can be kept up to date as far as mergers, take-overs, size of firms, are concerned. Philips will make the lists available to wholesalers on request, but does not take the initiative. It does not believe that the lists encourage wholesalers to charge uniform prices; they serve rather as a basis for the identification of customers.

Philips says that, so far as it is concerned, the preparation and circulation of the lists now have no restrictive intent or effect.

The uniform discounts on main brands recommended or published by the members of ELIC for local authorities

555. *BLI* says that there is substantial competition between wholesalers for local authority business and its recommended discounts are frequently exceeded. It suggests that it is almost impossible to devise a system to satisfy all local authorities. The old system was a source of complaint by authorities who did not qualify for maximum terms and who argued that they were all spending public money whatever their size. BLI appreciated the force of this argument and decided to give all authorities the same terms as from 1st April 1967, which in all cases were better than the old terms. Now some of the larger authorities are complaining that they have lost their preferential terms.

556. BLI accepts that the stable discount allowed to local authorities removed an element of competition, but the terms are fair and make for reasonable trading. Having established and published its terms to local authorities, BLI has to adhere to them otherwise it would be in competition with its wholesalers every time it put in a tender.

557. *Osram* considers a uniform discount to local authorities is the fairest system since these buyers are spending public money and providing lighting, not only to their own ratepayers, but to the public generally. Osram cannot see why one ratepayer should be charged a different price from another, when all are contributing to a common public service.

558. *Philips* says that since none of the companies in the Group recommends to wholesalers or contractors the prices they should sell to local authorities generally or any particular class, nor does any company in the Group in any way indicate to wholesalers or contractors any such price, any wholesaler or contractor can supply Philips' lamps to any local authority at any discount off list that it pleases. Philips will itself supply its main brands to any local authority at 40 per cent off list for filament and fluorescent, and 12½ per cent off list for mercury and sodium discharge. These terms, which were introduced by BLI in April 1967, made it more attractive to local authorities to buy direct from manufacturers, although one of the purposes of the quantity discounts for wholesalers was to encourage them to order and stock in the larger quantities to enable them to supply large users, including local authorities. The problem is that wholesalers of discharge lamps do not and will not stock any quantity of discharge lamps. The lamps are expensive in terms of the stocking space required: further, the wholesalers have been accustomed to an around-the-corner service from the manufacturers which has not encouraged them to develop this side of their business. The terms leave wholesalers with a meagre margin and they are likely to tender at the same 40 per cent and 12½ per cent off list, any margin they earn being limited to the settlement discount which varies from 2½–5 per cent. Philips says that so long as local authorities put their requirements up for tender without guarantees of overall purchases or individual consignment, a common level of discount is likely to continue to be quoted.

The size of the margins for wholesalers and retailers recommended or published by the members of ELIC

559. *BLI* says that its margins for wholesalers are no higher than are necessary to provide an incentive to handle lamps and give widespread distribution, and it

does not think they are high having regard to the services required. Lamps are bulky in relation to their low price; there are many types; they are fragile; they need storage under cover; and the ordering habits of customers necessitate breaking bulk packages. The profitability to individual wholesalers will depend on the 'mix' of his customers. Any wholesaler is free to cut his margin below the recommended level. Similar considerations apply to retailers, whose standard margin of 30 per cent on sales BLI does not regard as too high. Some retailers, in fact, constantly press for higher margins. BLI is constantly seeking to reduce distribution costs as part of its post-merger rationalisation programme and is in process of reducing the number of its regional depots from the original 41 to 9; the realisation of these economies depends on the extension of distribution by wholesalers, who must be given incentives to undertake it. If retailers' margins were reduced, BLI thinks that some would cease to handle lamps, with consequent inconvenience to the public.

560. *Osram* repeats that unless distributors are allowed a reasonable margin of profit there is a danger that they will cease to stock lamps. It considers that it is a matter of public importance for the preservation of a readily available national service that the profits of the distributive industry should not be cut to an extent which would result in a reduced service.

561. *Philips* repeats that none of the companies in the Group recommends or in any way indicates to wholesalers the prices or discounts off list price appropriate on resale to the different types of buyers. It accepts, however, that the prices and discounts at which it is willing to supply direct to different types of buyers generally provide a limit on the prices charged by wholesalers, although it believes that wholesalers often supply at prices below those charged by Philips for direct supply. Retailers' gross margins always seem excessive to suppliers and to the public, but lamps are not attractive goods to retailers, being bulky, fragile and of relatively low unit cost. Philips suggests that retailers' gross margins on a GLS 100-watt Philips lamp have dropped from 7·65d. in 1957 to 5·55d. today, if bought direct from Philips and sold at list price. If maximum quantity discount is earned, the comparison is 8·03d. and 6·85d. For a 5-ft. fluorescent tube, the comparison is 3s. 10½d. (4s. 4d. for the largest quantities) and 3s. 2½d. (3s. 10½d.). By contrast, retailers' costs have risen sharply over the past 10 years and to these costs SET has been added.

The existing arrangements of ELIC whereby members exchange information about recommended or published discounts and the classification and grading of customers

562. *BLI* says that if the arrangements had the effect of deterring the members from recommending discounts which would differ from those of the other members, and of discouraging competition, it could be agreed that their absence would enable a manufacturer to grant a higher discount without the certainty of its being matched by the other manufacturers. BLI says that news travels unbelievably fast in the lamps industry and it would be rare for a change in discount made by one of the principal manufacturers not to be known to the others within twenty-four hours. The information exchanged through ELIC is normally, therefore, common knowledge before the ELIC notifications are received. What deters a manufacturer from departing from his standard terms in favour of a particular customer is the speed with which the new terms will be matched and the consequent little (or no) benefit he is likely to derive from the change. The manufacturer is constantly besieged by large buyers seeking better terms, and if he gives

way in one case others will follow and his whole discount structure may be wrecked and profits can easily go out of the business in this way. Manufacturers should therefore be resistant to making special concessions. However, where BLI has considered it appropriate to change a buyer's grading or discount, it has not been deterred from doing so by the existence of the information arrangements of ELIC.

563. *Osram* says that it is simpler to obtain these details through ELIC rather than through normal trade channels, and that, in any case, it is quickly supplied with the information by distributors. An arrangement which reduces the amount of labour required to obtain the information is not contrary to the public interest if the practice which it assists is not itself contrary to the public interest.

564. *Philips* say that there is no obligation on members of ELIC to supply these details. The operation of the 'all purchases from all sources' system which applies to part of the Philips main brand business, involves classifying lists of customers by size of purchases and this is greatly helped by the exchange of information, and saves members a certain amount of routine commercial intelligence work. Philips does not believe that the system is of significance at the present time, and it is virtually impossible anyway for a supplier to keep his discounts secret. Philips claims that the scheme has not 'ossified' suppliers' systems of customer classifications. For example, in 1964 it reduced the list prices of its sodium and mercury discharge lamps and made them net trade prices, and at the same time it reduced the selling prices to wholesalers thereby altering its trading structure to encourage direct business with wholesalers. Philips also instances the changes introduced by BLI in April 1967. Philips says that, so long as it retains present arrangements for main brands, the ending of the system of notification would involve it in an increase in administrative work; however, Philips would not be greatly concerned if the system was given up although it does not believe that the public interest would be advanced thereby.

(i) Why the bulk of the reference lamps made by the principal manufacturers are sold at identical retail list prices, type for type

(ii) Why the discounts recommended or published by the principal manufacturers for the bulk of the lamps they supply are identical, type of lamp for type of lamp and class or grade of purchaser for class or grade of purchaser

(iii) Whether the practice of the principal manufacturers of sounding each other before making price and discount changes contribute to this uniformity

(iv) Whether the uniformity of prices and discounts has encouraged the multiplicity of brand names under which the principal manufacturers sell reference lamps

565. *BLI* says that the answers to (i) and (ii) are the same; since the products of the principal manufacturers are effectively identical, no manufacturer can command higher prices or grant resellers lower terms than those acceptable to his competitors. Matching is inevitable, and is enforced by competition in a free market. The practice at (iii) only short-circuits the time which would be taken to re-establish uniformity following any change made by one manufacturer. What is likely to deter a manufacturer from reducing prices or raising discounts where he thinks these commercially desirable is the fear of retaliation by the others, not necessarily in the field of reference lamps. If, by sounding, he finds his fears well founded, he drops his proposals but it would be wrong to say that he was dissuaded, for he was not in the first place prepared to risk retaliation. The price record of the industry supports the contention that the practice does not facilitate price increases which no manufacturer left to himself would risk introducing.

Competition is such that no manufacturer would advance his prices except in response to cost increases which were common to the whole industry and of such an order that they could not be absorbed. BLI says that prices and discounts are reasonable, and are set by competition which has been and continues to be a driving force compelling manufacturers to offset continual rises in costs by increased efficiency. The prices of filament lamps have scarcely risen in money terms over the period 1949–66 and have substantially fallen in real terms despite the slow growth of this sector of the market. Prices of fluorescent tubes have fallen markedly in money terms and even more in real terms over the same period. On (iv), BLI denies the implication that the uniformity of prices and discounts has any bearing on the multiplicity of brand names, which it says are historical and due in part to the existence of the two tier market. Goodwill attaches to brand names, and AEI lost a substantial part of its share of the market when it discontinued the Ediswan, Metrovick and Siemens brand names.

566. *Osram* says that the short answer to (i) is that the bulk of the reference lamps are identical and, of equal importance, the selling and distribution arrangements for main brands are identical. Differences in prices of main brands could only exist if there was heavy expenditure on advertising to create a belief in the public mind of non-existent differences. The same comments apply to (ii). Osram cannot obtain business at terms below those offered by competitors for comparable business. Equally, its competitors could not withstand its competition if its discounts were higher than theirs. On (iii), Osram denies that there are discussions concerning the desirability of a change proposed by one manufacturer. However, the manufacturers do meet together as distinct from the ELIC meetings, and do discuss the market and prices and discounts. These matters have also been discussed with the wholesalers through the EWF. If there is an intention to make a change, 70 to 80 times out of 100 it would be done. The fact that there are 30 or 20 times when it is not done might imply that some resistance is encountered from the remaining competitors to the change. The fact is that in a complex business such as that of lamps, with all the classifications of customers and all the types of lamps, there are times when what appears to be a sensible change in trading policy can have considerable implications for the manufacturer concerned; and it has happened on occasions that a hint of what might happen to the industry and his own business as a result of such a change has persuaded the manufacturer, perhaps, although he has not admitted it, not to go ahead with the intention which he had expressed.

567. On (iv), Osram refers to its own house brands—Osram, Elasta and Ascot —which are retained because of the goodwill which attaches to them. It does not regard the cheap 'own brand' lamps it supplies to certain distributors and grocery chains as linked to the uniformity of prices and discounts. These 'own brand' buyers wish to ensure that the goodwill of the products they sell is vested in them.

568. *Philips* says on (i) that the bulk of reference lamps made within the Group are not sold by retail bearing the group brand names but comprise lamps made for sale under distributors' brand names and lamps sold to users. Doubtless similar products are sold at similar prices in similar circumstances, due to competitive forces. Even if attention is directed to lamps bearing Group brand names and sold by retail, a substantial proportion is sold to electrical contractors and these lamps may or may not appear in contractors' quotations at list prices or at prices which are identical, type for type, with those of other suppliers. A lamp may bear the same list price as another technically superior lamp which is not,

therefore, of the same 'type' as the first. The Kingston and Luxram brands are examples; they are sold to distributors at higher discounts off list to compensate for the fact that the lamp is an unadvertised minor brand, or to enable the distributor to resell to users at discount off list. However, where list prices of identical products made by Philips and other manufacturers are identical, the reasons are:

(a) where a significant proportion of sales of a lamp is made through retail shops (at list prices) a supplier obviously cannot afford to price his lamp higher than his competitors' lamps;

(b) since competition between manufacturers has generally been in the area of discounts and rebates, it is not surprising that identical products have borne identical prices; otherwise a supplier would have difficulty in making the point that he is offering better terms than his competitors.

569. On (ii), Philips says that about a quarter of its main brand business is in direct sales to large users, including government departments, nationalised industries and large commercial and industrial concerns. The terms at which other manufacturers sell to these buyers are not published and Philips does not know exactly how their terms compare with its own. For the other three-quarters of main brand business, Philips' terms are broadly the same as those of the other manufacturers. It cites the background of common prices and discounts in the industry and the fact that the members of ELIC started off in 1960 with similar discount structures. It also refers again to the changes it made in 1964 in its prices and terms for discharge lamps, which it says the other manufacturers could not afford not to follow. Neither could Philips afford not to follow the changes introduced by BLI in April 1967 or it would have lost a great deal of business.

570. On (iii), Philips says that, so far as it is concerned, such soundings as have taken place have not contributed to uniformity of prices nor restricted competition. Soundings are a normal incident of commercial life and it would be impracticable to prevent them.

571. On (iv), Philips says it does not sell under a multiplicity of brand names. Until 1962 it had two brands only—Philips and Stella. Stella was established before Philips and had a good reputation. Philips has not so far considered it commercially advantageous to discontinue the Stella brand, partly because it can be sold in export markets where the Philips brand is already being sold by a local Philips company or by NV Philips. If the brand were to be discontinued, Philips would not necessarily pick up the whole of the Stella home business. The Corona brand dates from 1962 and is a second brand intended to compete in the cheap lamp sector and it would have been impracticable to sell it under the main brand names. Philips suggests that different brand names are particularly appropriate where they are supplied to distinct and different sections of the market, although it accepts that there is some overlapping in the second brands. The desire of distributors to have their own brands does not stem from uniformity of prices and discounts (if such exists). It is mainly Luxram and Kingston in the Group which handle customers' own brand business, and they did so before they were acquired by Philips; they have never practised resale price maintenance, and there is no question of their having introduced customers' own brands in order to circumvent some supposed rigidity of pricing policy on the part of the major manufacturers.

The practice of the members of ELIC of giving each other four months' notice of the marketing of new types of reference lamps

572. BLI says that the practice has no significant bearing on the question of competitive advantage. It suggests that, if the practice did not exist, information

would become available to competitors of any fundamentally new design as equipment makers would need advance details; and in any case competitors would have the information of any new lamp the moment it was marketed and could make arrangements to compete if they wished. The four months' advance notice is neither here nor there in the life of a lamp type. Users are accustomed to being able to buy a given type of lamp from any of the major manufacturers and tend to be cautious about lamps marketed by one manufacturer only and which are not interchangeable with a similar lamp of another make. BLI suggests that this is an example of the unwillingness of buyers generally to rely on a single source of supply. The practice does not involve the exchange of know-how, which is often of vital importance, and it has no bearing on the general uniformity of prices and discounts. Nor does it discourage research and development since if a new type involves a patentable invention there is no surrender of competitive advantage. Without the four months' rule, there would be likely to be a prolferation of designs which would benefit neither manufacturers nor consumers; the rule promotes interchangeability and widens the consumer's choice of his source of supply.

573. *Osram* says that experience shows that the practice does not discourage competition or prevent one manufacturer putting his products on the market before others; and it claims that the sole object is to ensure uniformity of fittings to enable the fittings to be used with all makes of lamps. The four months' notice is normally given by the manufacturer whose plans to introduce a new product are the most advanced; this will not normally enable a less advanced competitor to expedite his product and put it on the market at the same time, and will not deter another who has already devoted substantial expenditure to development of the product from attempting to compete. It does, however, give sufficient time for discussion of the most suitable design for the fittings so as to enable common designs to be adopted, and this enables the public to buy the reference lamps from whatever sources they think fit.

574. *Philips* denies that the four months' notification inhibits manufacturers from developing and marketing new types. Manufacturers of fittings must have advance notification and so must distributors, and such advance notice may vary from three days to three months before the launch of the product. The difference between the date of notification to other manufacturers and the date of general publication is too small to be of any significant commercial value to a manufacturer. In any case, the four months' notification does not disclose how improved performance or desirable new features are achieved, and would not allow time for a competitor to develop and market any significant innovation in the reference market. However, it serves a useful purpose since manufacturers may be working on similar developments and it is undesirable that the final products should have specifications which make them non-interchangeable in light fittings. There is some loss of interchangeability in the case of the 8′ fluorescent lamps where a particular make of fittings requires a particular type of cap. Such a difficulty has recently been successfully avoided in respect of BLI's new type of tungsten halogen lamp; discussions took place between BLI, Philips and Osram (the two latter were each developing a similar type of lamp) and standard dimensions were agreed. Philips sees no connection between notification of technical specification and any uniformity in prices and discounts. Competitors have sometimes told Philips the prices at which they proposed to market new lamps, but Philips has no arrangements to reciprocate and does not generally disclose the price of a new lamp until it is published.

The practice of the members of ELIC of agreeing together to discourage the supply of individual types of reference lamps, whether by price differentiation or otherwise

575. *BLI* denies that the practice is restrictive of competition or that the requirements of consumers are not adequately met. It instances the range of reference lamps available (almost 4,000 items) and says that it is only in minor areas, where alternative satisfactory types are available, that the manufacturers have sought to discourage the supply of particular types. For example, after withdrawal of clear GLS lamps below 150 watts from the catalogues a demand arose for clear lamps from the introduction of new types of fittings, such as glass chandeliers etc., and clear lamps were again listed. BLI says the practice is eminently desirable in the interests of economy and standardisation.

576. *Osram* says that developments over the last ten years, particularly in discharge lamps, have rendered many types of lamps obsolete. Owing to the small demand, these types remain in stock for long periods, increase overheads and cause confusion among retailers and consumers. It says that owing to the keen competition which exists, partially obsolete lamps would remain on the market indefinitely, increasing costs and prices, unless there was co-operative effort to eliminate them.

577. *Philips* says that distributors complain about the diversity of products, users complain about non-interchangeability of certain similar types of lamps, and works managers complain of the range of products and short runs. Philips indicates that the problems of standardisation have been the subject of much discussion between manufacturers and have been the subject of a few sporadic attempts to deal with particular aspects, but the problems remain. It is important that any steps to deal with the problems should not deprive the public of the diversity which it wants; and Philips has, for example, widened its range of fluorescent lamps by the introduction of new colours which it believes were welcomed. Collective steps to reduce variety through the removal of lamps made obsolete by the introduction of new products could be positively in the public interest, but steps so far taken have not been of significance.

The practice of the principal manufacturers of not marketing their respective long life GLS filament lamps for general supply

578. *BLI*, whose paper on the economic life of filament lamps is reproduced in appendix 7, says that 1,000 hours as an average life for GLS filament lamps is the compromise which yields the most economical life from the point of view of the user. Numerous government departments, large users and professional associations are represented on the committee of BSI which supervised the preparation of the BS 161 1,000-hours specification and keeps it up to date. 1,000 hours is the standard average life adopted in most countries, except Norway, where electricity is cheap. BLI claims that in fact, owing to improvements in techniques, the average life of its GLS lamps is substantially longer than 1,000 hours and approaches 1,500 hours, and that inconvenience in replacing lamps is minimal. It believes that complaints about short life relates to premature failures not to the designed average life. To introduce a new range for general supply in parallel with the existing range would increase costs of manufacture and greatly increase the cost of distribution; this would in turn lead to higher prices which would not be compensated for by any benefits conferred. BLI points out that longer life cannot be achieved without some sacrifice of light output, and there would be a

risk of a fall in lighting standards as a result of uninformed choice of the long life lamp.

579. As regards the use of 250-volt lamps on 240-volt supply, BLI says that some users who have voltage trouble buy 250-volt lamps and some retailers in areas where they know there is trouble with voltage fluctuation may be stocking 250-volt lamps, but BLI has no evidence that the public are asking for the lamps. On the other hand, the quantity of 250-volt lamps sold exceeds what one would expect from the electricity supply statistics. If these sales suggest a demand for longer life, then in this sense the users are solving the problem themselves. BLI, itself, hears of no demand for long life lamps.

580. BLI says it has no inhibitions about lamp life. Right across the range of its products it tries to do what it thinks is best. It makes lamps with all lives from five microseconds up to 15,000 hours, and it has felt all along that for the GLS filament lamps 1,000 hours is about right. There has been no sustained pressure for long life. For a great many years now, the long life issue has been argued, not only in this country but all round the world, and it becomes less acute as the proportion of the market demand for GLS lamps diminishes.

581. *Osram* suggests that since the publication of the Commission's report on the supply of electric lamps in 1951 the economic climate has become much less favourable to the use of the long life lamp because, while the price of lamps has remained substantially stationary, there has been a very large increase in average domestic electricity charges, from 1·37d. per unit in 1951 to 2·22d. per unit today. The International Electrotechnical Commission's standards of lighting have been decided by reference to all the relevant considerations, including the physiological effect of a lower standard of lighting. The characteristic of the IEC 64A 2,500-hour lamp is that it gives approximately 13 per cent less light in the 40-, 60- and 100-watt ratings than corresponding lamps made to BS 161. The fact that the human eye may not readily appreciate a diminution of 10 per cent in lighting intensity does not alter the fact that the diminution involves physiological strain which shows itself in earlier fatigue. Osram says that it is a relevant consideration that it is not desirable to market products which may result in detriment to the public interest merely because it may not be noticed by the public.

582. Osram says it is customary for users who experience over-volting in supply —and they will not know about it until it has been checked at their premises—to buy lamps of a higher voltage to compensate for this. This is also, it says, another way of achieving long life; it is a way open to people to obtain it.

583. *Philips* says that the relative economics of different lamps can be judged in terms of the light they actually give for a given wattage consumption over a given period of time. The 'optimum life' depends on the price of the lamp and the cost to the user of the electricity consumed—the lower the price of the lamp and the greater the cost of a unit of electricity, the shorter the optimum and vice versa. Philips suggests that a 2,000-hour lamp would rank low in any Consumer Association 'Guide to the Best Buy of GLS lamps' so far as economy was concerned, and even the 1,000-hour lamp is a concession to the convenience of less frequent replacement at the expense of economy. In considering whether the public suffers any detriment because Philips does not make or promote a long life GLS lamp, the question to be considered is whether there is any section of users who are prevented from making a sacrifice in economy in order to obtain the convenience of less frequent replacement. Manufacturers could meet such a demand by (a)

making a higher wattage lamp with the same output of light as BS 161 but a longer life or (b) the same wattage lamp with a lower output of light than BS 161 but a longer life; these alternatives involve paying more per unit of time over the average life of the lamp than is the case with BS 161 lamps. Philips says that GLS lamps are generally used indoors where fitting is easy, and less frequent replacement is for most users of slight, if any, advantage. Where fitting is difficult, less frequent replacement can be achieved:

(i) by fitting one of the long life filament lamps already on the market, for example, Luxram's 2,500-hour lamp, Omega's 2,500-hour lamp, and a lamp which Kingston will supply on request;

(ii) by under-running 250-volt lamps on 240-volt supply, which reduces light output by 12 per cent, increases life from a nominal 1,000 hours to 1,750 hours, and increases cost to a domestic user per unit of light per unit of time by 3·6 per cent;

(iii) by fitting fluorescent lamps;

(iv) in out-of-doors installation, by fitting discharge lamps.

Philips suggests that restriction of choice is therefore minimal, and that had there been any significant demand for long life GLS lamps Woolworth, which distributes about one-third of the retail market in GLS lamps, would have demanded such a lamp for supply under its own brand name.

584. Philips says that to manufacture a main brand long life lamp would significantly raise its manufacturing and distribution costs, and would result in duplication of production, stocking and distribution and in shorter production runs. Considerations for Luxram and Kingston are different as they are geared to short runs and diverse stocks. Philips suggests that any effort to promote sales of long life GLS lamps would be misleading as it would be difficult to explain the technical considerations to users, and any successful promotion would be the result of inducing users to make an apparent but false economy. Philips suggests that a 750-hour lamp would provide better value for the consumer's money but it has not been suggested that the non-availability of that lamp restricts the user's choice. The manufacture of a long life or a short life lamp would, in Philips' view, outweigh the benefits of standardisation represented by BS 161 and its international counterpart IEC 64 which result in economies of production and supply and the removal of technical trade barriers. Increased standardisation is backed by the Board of Trade and the Ministry of Technology, through the European Standards (Electrical) Co-ordinating Committee (CENEL) representing all EEC and EFTA countries.

The practice of the principal manufacturers of inter-trading with one another in reference lamps

585. *BLI* says that the extent to which it inter-trades in reference goods, whether as seller or buyer, is small and the transactions amount to about 5 per cent only of turnover in reference lamps. The bulk of its purchases is of discharge lamps; the reason is that there are a number of technically dissimilar competing types. In sodium lamps, BLI, Osram and Philips have each concentrated on a different type. In an inquiry for both fittings and lamps, a customer who preferred BLI's fittings might want lamps of one of the other types (e.g. to conform with his existing installations) and if BLI is in a position to supply these other lamps it can compete for the contract. In this context it claims that the inter-trading enhances

competition. It would be uneconomical for BLI to make all three competing types; to do so would constitute a waste of its resources. As regards the rest, it buys either to overcome temporary shortages or to supplement its range. It wishes to offer all lamps for which there is a demand, but to manufacture all the types, particularly for short runs, would not be sensible. All its purchases are made ad hoc, as are its sales. It contends that inter-trading does not reduce competition since it buys where it could not otherwise supply at the time or where it could not manufacture itself at an effectively lower cost. In some respects inter-trading enhances competition, and at the lowest it increases the consumer's choice of supplier; and this is in the public interest. Further, by its sales of fluorescent lamps BLI has assisted other manufacturers to fulfil export orders for which they would otherwise not be able to meet delivery requirements, and inter-trading accordingly helps to maximise exports of reference lamps.

586. *Osram* says that inter-trading between the larger manufacturers is on a very small scale: in its case it does not exceed one to two per cent of turnover. Its purchases are mainly of specialised types to enable it to supply the full range, and the remainder is of lamps required to meet unforeseen demands, and on occasion to meet demands from abroad. Inter-trading is merely a means of smoothing out temporary difficulties and in so far as it helps manufacturers to provide a complete and speedy service it must tend to promote competition. If prices and discounts were not uniform, Osram says that it and the other manufacturers would still be willing to supply one another. No conditions whatsoever relating to prices or discounts are placed on the lamps Osram sells to other manufacturers.

587. *Philips* says that only about 5 per cent of its total sales of main brands in 1965 were inter-trading sales. It refers to the economics of the loading of modern high speed machinery, and says that capital investment in such machinery is justified only if the market demand is large enough to provide the long runs which result in the proper utilisation of the machinery. For some types of lamps the market requirements of a particular manufacturer would not justify the production plant needed and, in such circumstances, inter-trading between manufacturers serves a useful purpose by permitting a greater degree of mechanisation and rationalisation of production than would otherwise be achieved. The rationalisation of production resulting from inter-trading is not the result of collective agreement or planning but arises from individual negotiation between individual manufacturers who have decided to adopt sensible and practical solutions to their particular problems. The products are generally of standard specification and quality and Philips suggests that it is not illogical or undesirable that a product made by one manufacturer is marketed by his competitors. Philips suggests that with the increasing economies of scale attainable in the industry, small manufacturers are increasingly likely to consider giving up production and becoming distributors of own brand lamps made by others. Luxram and Kingston, as a matter of independent commercial judgement, got Philips to make certain standard types for them.

588. Philips claims to be the world's technical leader in sodium lamps and says that it is unlikely that anyone else could make as good a lamp at as low a cost, and it supposes that the British manufacturers who buy Philips' sodium lamps do so because even if they could make them the cost would exceed the price at which they can buy from Philips. If Philips ceased to sell to them, they would be in a worse position to compete with Philips in this field than they are now. Philips,

also, gains from its sales to the other manufacturers because the latter, if they did not have the advantages of marketing bought-out sodium lamps under their own brand names, might make or import sodium lamps which might thereby tend to reduce Philips' production runs and economies of scale.

The practice of the principal manufacturers of selling similar or very similar products under different brand names and at different prices and different recommended resale prices and discounts, according to the sections of the market served, and which are not directly related to differences in costs

589. *BLI* suggests that the existence of the cheap lamp market has no bearing on the uniformity of prices and discounts. The factors already described which produce the uniformity would operate without the participation of the principal manufacturers in the cheap lamp market; this is demonstrated by the uniformity of prices and discounts for fluorescent lamps which until recently did not sell in the cheap lamp market. Neither does BLI think that the existence of the principal manufacturers' main brands contributes to the general uniformity of prices and discounts as far as resellers are concerned. BLI agrees that its main brands of GLS lamps and its second brands of GLS lamps are similar; there are differences, and whether the filament is coiled coil or single coil is one of the differences in cost. Distribution is another difference in cost. Second brands are mainly in the domestic range of single-coil GLS lamps, and have a restricted distribution. The absence of the second brands would not make retailers any more willing to accept lower margins on main brands or increase the commercial advantage to them of cutting main brand prices. As far as wholesalers are concerned, the existence of second brands would contribute to the general uniformity only if it could be argued that in the absence of second brands the users and retailers who now buy them would be able to exert sufficient pressure on wholesalers to grant them higher discounts on main-brand lamps than the wholesalers would be willing to grant them now. BLI suggests that only a few users and retailers would be in a position to do this.

590. BLI suggests that the existence of second brands in the domestic range provides a measure of competition with main brands in that range, which would otherwise not exist. In 1951 the Commission considered it in the public interest that the competition offered by second brands should not be diminished; BLI suggests that there has been no change since then which would invalidate the Commission's view. Wherever lamps are sold there is a two-tier market and this seems to work; main brands are sold through normal distribution channels and second brands are sold at lower prices in specialised sectors of the market.

591. *Osram* says that the characteristic of the cheap lamp is that a nation-wide distribution service is not provided, and it suggests that the matter is well illustrated by its average realised prices of different brands of 100-watt lamps. The factory costs of a main-brand single-coil lamp and a second-brand single-coil lamp are approximately the same, subject to relative loadings on the factory. The difference is in distribution costs. The cheap brands are sold only to a few purchasers who take large quantities at limited points of delivery; the sales are not profitable and are useful only because they bear a proportion of the overheads. The Ascot and similar brands are sold at a profit, but only because they are delivered in large quantities to a limited number of points. The higher cost of distribution in the case of the main brands, Osram and Elasta, is mainly in the distribution from

Osram's depots and stores to reach the many wholesalers throughout the country, and to match the service given by competitors. A national service through the wholesalers to the large number of retailers could not be maintained on the basis of the prices charged for Ascot and similar brands, and it is only possible to maintain a national service by the sale of the main brands at a higher average realised price. The main-brand lamp is subsidising the cheap lamp, and although it does not subsidise the Ascot and similar brands it is fulfilling a public need which cannot be met by these brands. Osram says that in reality it is not the cheap lamps which assist in maintaining the price of the dearer lamps, but it is the sale of dearer lamps which enables the cheaper lamps to be marketed.

592. *Philips* suggests that there is not now a two-tier market in the sense in which such a market existed in 1951. The market today is divided into a number of complex sectors resulting from competitive forces and not from any multilateral actions of manufacturers or distributors. There is the sector comprising the largest buyers who buy main brands direct and which accounts for about a quarter of Philips' total business in main brand lamps. Second, there is the cheap lamp sector in which one finds single-coil lamps not made under BSI Licence and which covers retail sales by electricity boards, chain stores, supermarkets, grocers etc. Third, there is what Philips terms the 'discount sector' in single-coil lamps, such as those sold by Luxram, Omega and Ascot; Philips claims that these are subjected to higher quality control than 'cheap lamps' and some are made under BSI Licence, but wattage for wattage, they have lower lumen outputs than coiled-coil lamps. Fourth, there is the market for main-brand coiled-coil lamps sold mainly through the electrical distributive trade. Competing in this sector is Crompton's main-brand single-coil lamp and Kingston's single-coil lamp, although in Kingston's case the lamp has localised distribution and a higher distributive trade margin. Competition between manufacturers in the first sector is on price and quality. In the 'cheap lamp' sector, for example, costs are lower for a number of reasons, including bulk deliveries and absence of advertising. The product may appeal because of the initial saving of, for example, 8½d. on a 40-watt lamp and 6½d. on a 100-watt lamp compared with corresponding main-brand coiled-coil lamps. But because of the lower light output of the product, the domestic user pays, over a 1,000-hour life, 12 per cent more in the case of the 40-watt lamp and 6 per cent more in the case of the 100-watt lamp per unit of light per unit of time than he would pay in the case of the corresponding main-brand coiled-coil lamps.

593. Philips says that what it has termed the 'discount' lamp is better than the cheap lamp. Until it brought down the prices of coiled-coil lamps to the same level as single-coil in 1958/59, there were three different price levels at which trade users could buy—main-brand single-coil (then still commonly available), main-brand coiled-coil and 'discount' single-coil, and the largest discount offered on the last made it attractive to trade users. Although today buyers of main-brand coiled coil and 'discount' single-coil pay about the same per unit of light per unit of time over the life of the lamp, the 'discount' lamp has certain advantages to the trade user; for example vandalism makes him anxious to spend as little as possible on the purchase price and, since he is often not personally the user, the lower light level is less of a consideration than for the domestic user. In the main brand/electrical distributor sector costs of advertising, distribution, etc. are higher all round. No one brand with one marketing policy would be appropriate for all these very different sectors, and any attempt to impose such a policy would

destroy rather than contribute to the wide choice available under present conditions. The present situation (1967) is one in which the manufacturer's price, certainly to the wholesaler and potentially to the retailer, for the main-brand lamps is in fact as low as the price at which the cheap lamps are currently being sold. The discount has moved so far upwards that the differential has almost disappeared.

(i) Whether the practice of the principal components manufacturers of discriminating in the prices charged for components puts certain buyers at a disadvantage

(ii) Whether the acquisition by Lamp Caps Ltd. of Lamp Presscaps Ltd.'s business in vitrited caps will result in added disadvantages to certain buyers of these components

594. *BLI* does not accept that the component manufacturers in which it has an interest (Glass Bulbs, GTC, Lamp Caps, Lamp Metals, Lamp Presscaps) discriminate in any relevant sense in the prices charged for components. Parents take supplies at special prices, but this is normal practice in industry and BLI claims that it is not contrary to the public interest that those who have provided the investment should, if they choose, take the benefit in this form rather than by way of increased dividend. The parent company or parent companies concerned are, in any case, by far the largest buyers of the components. As far as Glass Bulbs is concerned, the undertaking given in 1951 has at all times been honoured, and its pricing structure has from time to time been reviewed by the Board of Trade. It has a published price list and a list of quantity rebates, and all outside customers except Philips are supplied accordingly. Philips has had a ten-year contract for lower prices, but the same terms would have been extended to any customer for a similar period and for similar quantities. GTC sells to outside customers in accordance with a price schedule for standard products which is available to all customers on application. Prices for hand-made bulbs are negotiated according to the specification and quantity required. The company is not in a monopoly position and sells in acute competition with Chance. Lamp Caps has no standard selling prices or quantity discount schedules, but quotes in accordance with market conditions and potential volume of business. The same is true of BLI's wholly-owned subsidiary, Lamp Presscaps. Lamp Metals is in competition with Mullard and others: its prices are set by the competition and it is operating at a loss.

595. As regards (ii), BLI says that this will operate to the advantage of all buyers of these items. It deals at length with the comments of Philips and Crompton on the merger. It accepts that for a short period after the merger there was a shortage of supplies of vitrited caps to all customers, including parents, due in part to difficulties of re-commissioning plant in the new area and in part to temporary over-ordering by customers. BLI refers to reductions made in the prices since the merger. It regards Philips' complaint about bi-pin caps as unreasonable. Production of this type of cap was not transferred to Lamp Caps. The complaint seems to be that Lamp Presscaps does not make a special line of bi-pin caps for Philips which would be indistinguishable from that used by Philips. BLI says that to do this would be uneconomic and would disrupt Lamp Presscaps' production; in any case, the caps would probably not be competitive in price with those which Philips could buy from NV Vitrite.

596. As regards Crompton's complaints, it is true that prices to it have increased, as they have to other customers, due to increases in the market price of copper

and consequently of brass. An increase of 12 per cent quoted to Crompton in May 1965 covered a period in which the price of copper had risen by 90 per cent. In November 1965 copper rose by a further 11 per cent and it was only because Lamp Caps had made a favourable brass contract in April 1965 that it was able to carry the price quoted to Crompton. By the time of Crompton's next inquiry in May 1966 the price of copper had risen by a further 53 per cent, but Lamp Caps' quotation to Crompton was only 12 per cent higher than in May 1965. Here again, the company had had the foresight to contract for a year's supply of brass before the copper price increase took effect. Other cap suppliers were not able to contain their price increases to the same extent—in April 1966 NV Vitrite advised its customers of price increases of 15–20 per cent or more. As regards Crompton's complaint that the latest price of the standard BC cap is the same as last year's contract although the price of copper has fallen, BLI says that this is true, but there has been no reduction in Lamp Caps' costs which would enable a price reduction to be made. Lamp Caps had made a contract for brass at the same price as for 1966 (with suppliers who had lost heavily on the previous year's contract); it realised the price of copper might come down but regards the contract as prudent in relation to a commodity which is subject to a high degree of political risk. BLI claims that Lamp Caps has saved customers large sums by shielding them from the full effects of rises in the price of copper and that it is unreasonable of them to complain when they do not get the immediate benefit of falls. Crompton also complained that both Lamp Presscaps' and Lamp Caps' prices have been high compared with those of NV Vitrite for comparable types. BLI says that no conclusions could be drawn from the meagre details provided by Crompton. The Vitrite prices quoted were for screw types which are standard on the Continent but are low volume types for Lamp Caps. Lamp Caps cannot expect to match Vitrite's prices on Vitrite's volume lines any more than Vitrite can compete with Lamp Caps' on Lamp Caps' volume lines. BLI says, in conclusion, that the acquisition by Lamp Caps of Lamp Presscaps' business in vitrited caps gives the best prospects of reducing or holding the prices of these caps to United Kingdom manufacturers.

597. *Osram* says that it has a very small lamps components business in the United Kingdom, and any discrimination in the prices charged by it consists only of reductions in the prices charged to customers who place large orders, or who offer the prospect of substantial business. It says that the customers of the companies of which it is joint owner with BLI—Glass Bulbs, GTC, Lamp Caps and Lamp Metals—who place large orders or who offer the prospect of substantial business pay lower prices than those who do not. This however is a normal incident of a competitive system and a factor which tends to encourage economic efficiency. The parents of the jointly owned companies are charged lower prices than other manufacturers, but Osram submits that this is not discrimination in any true sense of the term. The companies were brought into existence as a measure of rationalisation by the merger of manufacturing enterprises carried on by companies; it was not a case in which a small group of manufacturers attained control by purchase of the sources of supply from which the lamp industry obtained its components. Before the mergers took place, the individual shareholders carried on these manufacturing enterprises primarily to provide components for their own lamp manufacture and the sale of the components to other manufacturers was a secondary activity. The components used by the manufacturers in their own manufacturing processes were costed for internal accountancy purposes on a basis which did not bear any particular relationship to the prices at which the

components were sold to other manufacturers. Osram says that not unnaturally the same pricing system was preserved after the mergers with the result that the prices charged to shareholders of these component manufacturers at the present time are derived historically not from the prices charged to outside manufacturers but from the internal costing arrangements originally adopted. The shareholders are and always have been very much the largest purchasers of the components; the effect is that the shareholders, who are entitled to earn profits from their investments, take part of their return in the form of lower costs in their own manufacturing process instead of dividends. Any manufacturer who wishes to do so can if he thinks fit make his own components and the advantage if any enjoyed by the shareholders in these companies is only the advantage (if any) which necessarily accrues to those who make their own component parts. Osram's replies to the comments of Philips and Crompton on the merger of Lamp Press-caps' and Lamp Caps' interests in vitrited caps are generally similar to those of BLI.

598. *Philips* says that it dislikes a position in which there is only one supplier in the United Kingdom from whom it can purchase glass bulbs and lamp caps, respectively, but it makes no complaint that in the past it has been unfairly discriminated against or that it is now being unfairly discriminated against in respect of price. As regards the smaller manufacturers of reference lamps, a consequence of Philips' acquisition of controlling interests in Luxram and Kingston has been that both these companies have been able to buy glass bulbs and lamp caps at Philips' prices. In the case of Luxram, this facility has saved the company about £50,000 a year, which has materially contributed to the continued viability of Luxram as a manufacturer. Philips' subsidiary, Mullard, says that in its supply of components for reference lamps it does not discriminate between customers. Prices are on a quantity discount basis, with the exceptions of those to associated companies which are at an inter-company price based on manufacturing cost.

Whether, and if so to what extent, there has been a decrease since 1951 in the amount of foreign technical information available to the electric lamps industry in the United Kingdom and in the exchange of technical information between United Kingdom manufacturers

599. *BLI's* reply to a question addressed to it on an allied matter is in paragraphs 613 and 614.

600. *Osram* says that it is difficult to compare the extent of the flow of technical information before 1951 and since. Changes of staff and the emphasis on development of discharge lamps make any reliable comparison impossible. Osram's active interchange of technical information with General Electric USA and NV Philips has continued, with regular visits to and from these companies, and it says that the emphasis on discharge lamps may have made the interchanges more fruitful for the parties than in the years preceding 1951. Osram also has a continued technical relationship with Osram GmbH, but this has not been so active in the past two or three years as formerly and the former agreement has not been renewed and is still under discussion. However, Osram GmbH has a technical exchange with General Electric and NV Philips and Osram feels that little has been lost by the recent reduction in direct exchanges with Osram GmbH. Osram's agreement with Claude Paz et Visseaux, France, relating to discharge lamps only, expired in December 1966. Osram refers to the termination of its exchanges

with AEI L & L consequent on the AEI L & L/Thorn merger; prior to the merger, AEI L & L had interchanges with General Electric and NV Philips.

601. Osram says that the position as regards components, however, has changed, notably in glass (GTC) and metals (Lamp Metals) where exchanges with General Electric, NV Philips and Osram GmbH ceased following the AEI L & L/Thorn merger. Because of Thorn's links with Sylvania, the US Anti-Trust laws prevented the continuance of interchanges between General Electric and GTC and Lamp Metals, and the withdrawal of General Electric from the interchanges was followed by the withdrawal of NV Philips and Osram GmbH. Glass Bulbs was not affected as the exchanges there are with Corning, the American manufacturer of the glass bulb ribbon machine.

602. *Philips* says that it owns no patents, but has access to the manufacturing know-how and patents of NV Philips. NV Philips has patent licensing and know-how agreements with General Electric, America, and Osram GmbH, and a patent licensing agreement with Westinghouse, America; these arrangements are said to be the same as, or similar to, NV Philips' arrangements in 1951. In 1951 NV Philips also had cross-licensing arrangements with the principal members of ELMA, certain other cross-licensing arrangements with the other parties to the 1948 Lamp Agreement, a pre-war licence agreement with Crompton and a cross-licensing know-how agreement of 1950 with GEC and BTH (a company in the AEI group). Philips says there was no arrangement with Thorn but NV Philips was prepared to grant to Thorn, as to any other manufacturer, a patent licence on reasonable terms. NV Philips, GEC and AEI continued to exchange patent licences and know-how, first under the 1950 agreement and then under the successor agreement of 1963; this continued until the AEI/Thorn merger of 1964, when the exchanges between NV Philips and AEI ceased by mutual consent on account of Thorn's connections with an American company which would have conflicted with NV Philips' connections with General Electric, America. NV Philips gave notice to determine the 1962 agreement at the end of 1965 as it wished to be free of existing commitments when negotiating a new agreement with General Electric. A new agreement with General Electric was negotiated, and a new agreement between NV Philips and GEC will be finalised before long.

603. In 1957 NV Philips and Crompton concluded a new agreement which provides for the grant of patent licences and know-how to Crompton on a royalty basis. NV Philips is prepared to grant similar licences to any United Kingdom manufacturer on ordinary commercial terms.

604. Commenting on the ELMA members' belief, as reported by the Commission in 1951, that technical exchanges would not continue without a common price agreement, Philips says that the long history of 'cartelisation' of the lamp industry led those within the industry to that view, but that the extent of international exchanges, in particular between NV Philips and General Electric, between the British GEC and General Electric, and between General Electric and the AEI interests, appeared to have been overlooked. In this situation, to determine technical exchanges, of at least an indirect nature, between NV Philips, the GEC and AEI interests would have presented peculiar problems. Furthermore, the abandonment of the old cartel arrangements was a gradual process and the advantages of exchange (notably that of the NV Philips—General Electric) were such as to outweigh the commercial advantages of secrecy between manufacturers who were increasingly and ultimately in full competiton with one another in the United Kingdom market. Philips suggests that the climate of opinion in the

lamps industry internationally has changed since 1950, and that it has been found that international technical exchange was worth retaining after the end of the Phoebus agreement and the break up of the international cartel because of its contribution to individual technical development. Its answer to the question posed is, broadly, that there has not been a decrease in the amount of foreign technical information available in the United Kingdom and in the exchange of technical information between United Kingdom manufacturers.

II: The Submissions of BLI, as the Dominant Supplier

The development of BLI's dominant position

605. BLI pays tribute to AEI L & L's technical proficiency and reputation, and suggests that the two parent companies of BLI were complementary in that each was strong in a field where the other was less strong. Thorn's strength was in fluorescent lamps, of which it was the largest United Kingdom producer, and in control gear and fittings for these lamps; but in the main-brand filament lamps market Thorn had found it difficult to compete with the better established Mazda and Osram brands. In 1964 over 42 per cent of Thorn's sales of filament were of second brands whereas AEI L & L's sales of filament (which were almost the same as Thorn's total sales) were all main brand. Thorn's business in discharge lamps was only about half the size of that of AEI L & L's. In fluorescent lamps AEI L & L was a high cost producer, and in the associated field of fittings it was incurring heavy losses. Whilst the leading position of BLI stems from the technical proficiency and reputation of both parents, the fact that the merger gave control to Thorn reflects the relative efficiencies of the two concerns. Thorn in a relatively short time had acquired a substantial share of the lamps market by skilful employment of capital; by careful attention to costs; by its assessment of the market; and by heavy capital investment in high volume production plant and its ability to find export markets to provide economic load for the plant. AEI L & L, on the other hand, was 'factory dominated' and out of touch with the market in some aspects; was a high cost producer of fluorescent lamps unable to compete in export markets; and was showing inadequate returns on its capital employed. Had the relative positions of the two concerns not been as indicated, the merger would not have taken place on the basis of major shareholding and control resting with Thorn.

606. BLI says that patent protection has little bearing on its dominant position. There are now no master patents in lamps manufacture, but know-how is, by contrast, of greater importance. Although BLI finds its know-how agreement with Sylvania advantageous much of the company's know-how has been built up within BLI (or within Thorn) and has not been acquired under know-how agreements. The patent licence and know-how agreement of 1948 with Sylvania, said to be the leading American manufacturer of fluorescent lamps, gave Thorn a start in fluorescent tubes and access to production plant; but Thorn's rise in that field was mainly due to its courage in investing in large scale production at a time when home market demand for tubes was relatively low. Apart from access to Sylvania's patents (which were not in the 'master' category) there was no patent protection which bore on Thorn's advance except that, having patents of its own, it was better able to resist any allegations of infringement. Since the war, the most important patents have probably been the halophosphate patents; these were the subject of litigation between GEC and Thorn at the time of the Commis-

sion's 1951 Report. If Thorn had been compelled by the patentees to stop using the halophosphate powders, it is likely that its growth would have been retarded.

607. Thorn, and subsequently BLI, operated in the belief that high volume and relatively low overall margins maximise profits. This policy has led to heavy investment in advanced mass production processes for reference lamps (for example, the Phase III machine) and associated products, and to a vigorous export programme in order to achieve the loading required to realise the economies of scale possible with such plant. BLI says that these two factors, allied to its technical proficiency and its research and development, account for the company's strong position in reference lamps. It claims that it is the acknowledged leader to research and development in the field of phosphors of all kinds.

Profits

608. In discussing the level of profits earned on its sales of reference lamps, BLI says that it uses as its yardstick its declared aim of achieving levels of profit on capital employed of between 15 and 20 per cent for the business as a whole; owing to the intensity of competition at home and abroad the results have been much lower. The contributions made by its various activities will be different each year and will vary from year to year. During the period under review (1964–1967) reference lamps have not contributed sufficient to the overall profit and BLI does not regard the return as reasonable (in that it is too low); but the period was one of exceptional difficulty on account of the merger, the full benefit of which has not yet been achieved, and BLI does not regard the results as indicative of future achievements.

609. BLI suggests that the movement in the retail price (ex tax) of typical lamps in recent years is relevant to the consideration of the level of profits earned on reference lamps. It has supplied a summary, reproduced in table 4, of the movements in the list prices of some popular types of main-brand lamps in the period 1956–1967. It says that the details shown reflect three policies adopted by BLI:

(a) prices of coiled-coil filament lamps were brought into line with single-coil in 1960;
(b) prices of 100-, 60- and 40-watt lamps were made the same in 1961;
(c) the price of 75-watt lamps was made relatively unattractive to discourage the demand.

610. Purchase tax was higher in 1949 than in 1966. BLI's examination of index numbers, using 1949 as the base year, shows that prices of all the filament lamps rose by far less than the movement in the retail prices index and the hourly wage rates index during the same period, and demonstrates that through efficiency and technical innovations it has been successful in absorbing costs over a long period of time.

611. BLI says that its results for 1965 reflect the effect of combining the very low profits of the AEI activities with the relatively more profitable Thorn activities; in 1966 the results moved towards the previous Thorn level; but in 1967 (in common with other industries) BLI lost ground through the measures taken by the Government in July 1966. The drop in sales particularly affected the profits on incandescent lamps, as the company's business is geared to high volume production and there is a high proportion of fixed costs. This means that even modest variations in turnover can result in considerable fluctuations in profit levels.

612. BLI refers to the high investment needed on filament lamps to improve cost efficiency in order to contain the heavy increases in the prices of materials, labour and services, and it points to the Phase III machinery where the total cost of the first machine was £263,000. BLI's total investment since the merger in plant and machinery for filament lamp manufacture (after deducting investment allowances and grants) has been £992,000 while on all other reference type lamps it has been £857,000. It says that the market for domestic type filament lamps has grown little in the period under review; its total sales of filament lamps in the home and export trades increased by 7·5 per cent over the three years to 1967, whereas its sales of domestic type filament lamps in the home trade increased by 4·4 per cent. BLI's total sales of all other reference type lamps for the same period increased by 24·5 per cent.

Whether the formation of BLI has resulted in a decrease in the amount of foreign technical know-how available to the electric lamps industry in the United Kingdom or in limiting the exchange of technical information between United Kingdom manufacturers

613. As far as reference lamps themselves are concerned, BLI does not think that its formation has resulted in either of the effects indicated. The position before the merger was:

(a) Thorn had a patent and know-how exchange agreement with Sylvania

(b) AEI and GEC were parties to similar agreements with

(i) General Electric USA

(ii) NV Philips

(iii) Osram GmbH

These agreements benefited AEI L & L, as a subsidiary of AEI.

(c) AEI and GEC, who individually drew on the foreign technical know-how at (b), had an arrangement between themselves for exchange of technical information.

The only result of the formation of BLI was to detach AEI from (b) and (c) and attach it to (a), but this did not diminish the total amount of foreign technical know-how available to the industry, nor did it limit the exchange of technical know-how between United Kingdom manufacturers. BLI says it thinks that (b) (i) ended at the end of 1964 by the effluxion of time, and that (b) (ii) and (iii) were already under notice of termination before the formation of BLI. It says that if the foreign concerns or any of them have not renewed their links with GEC, that is not the result of the formation of BLI.

614. As regards components for reference lamps, BLI says there has been some decreases in the amount of foreign technical knowledge available, but for different reasons. The Corning company, USA, which provided the know-how for Glass Bulbs, has indicated that it wishes to renegotiate its agreement with Glass Bulbs and GTC. As far as Lamp Metals is concerned, there has been a switch from General Electric know-how to Sylvania know-how. Subject to the success of the negotiations with Corning, BLI considers that there has been an increase in the know-how available to the jointly-owned component companies.

Whether BLI has accepted, specifically or tacitly, any restrictions in the export of reference lamps as part of any understanding or arrangement whereby foreign manufacturers are restricted from competing in the United Kingdom market

615. BLI says it is not party to any arrangement or understanding in which any 'foreign manufacturer' in a real sense is restricted from competing in reference lamps in this country. The companies in India, owned jointly by NV Philips, AEI L & L, GEC and Crompton, are restricted to selling to the partners and their respective distributing and associated companies, and their aim is to serve the local market. The qualified obligations of the partners to obtain their respective requirements for the local market only from the jointly owned companies are purely academic as regards possible restrictions on exports, since the Indian Government would not allow imports of goods where the demand could be met by local production.

Research and development

616. BLI says that its formation has not resulted in any diminution in the amount spent on research and development compared with the amount previously spent by Thorn and AEI L & L. In the year 1963 AEI spent £446,000 on research and development and in the year ended March 1964 Thorn spent £320,655. In the year ended March 1967 BLI spent £773,465 and £814,400 is budgeted for the year ending March 1968. BLI says that it would be appreciated that there has been rationalisation of research and development activities previously carried on separately, and there have been savings with avoidance of duplication. The expenditure is, accordingly, not only greater but is more advantageously employed.

617. BLI is well aware that in the long run it can hope to retain or enhance its position only if it keeps in the forefront of technical development. It is inevitable that at any given time there are more projects competing for attention than there are resources available to apply to them, but the current range of BLI's activities in this field is wide; for example it includes work on tungsten halogen lamps, in the incandescent lamp field and in high and low pressure sodium lamps. Another aspect is research into new and improved phosphors, cathode ray tubes and electro-luminescent devices. No aspect of BLI's business is overlooked and other subjects covered by its research and development include research into materials and improvements in engineering to effect savings in costs.

General

618. As to whether it is or may be expected to be against the public interest that the production and supply of reference lamps are so largely concentrated in the hands of one manufacturer, BLI suggests that it is an overstatement to say that at the present time production and supply of reference lamps are so largely in its hands. Nearly 60 per cent of supplies is supplied by other concerns, and this proportion is not shared between a large number of small concerns each with an insignificant market share but is to a large extent in the hands of a few companies each of whom has a substantial market share and is backed by large resources (for example, by GEC, NV Philips, Hawker Siddeley). BLI emphasises that, in its view, further concentration of the lamp industry in this country, should it occur, would not be contrary to the public interest. It considers that there is scope for further rationalisation of United Kingdom lamp-making interests with a view to achieving additional savings in costs and a volume of production which would increase the industry's competitive position in world markets. The present degree

of concentration has not produced a unit comparable in size to the industry's major international competitors, though it represents a step in that direction. If the industry is to compete successfully in export markets, it cannot afford for long a situation in which the relatively small volume of United Kingdom business is spread, as it is, between a number of competitors of not widely dissimilar strength.

619. BLI claims that the merger which produced the degree of concentration mentioned was clearly in the public interest, and its full benefits have yet to be seen. It enumerates what has already been done or is in train, including the reorganisation of the various factories to concentrate groups and types of lamps to achieve the greatest cost advantage; the closing down of surplus factories; the centralised control of distribution and the integration and reduction in the number of regional depots which it is calculated will save at least £1·1 m. by 1975; progress towards rationalisation of the main brand selling companies; and integration and central control of research and development and of finance. BLI says that the effect of all these measures will be to increase its competitiveness and put it in a better position to absorb the inevitable increases in costs. The prospects of holding down prices and perhaps of reductions in the prices of some reference lamps will also be increased.

620. Apart from the opportunities for rationalisation provided by the merger, the plain fact is that large volume production is an inescapable requirement of the lamps industry in modern conditions. The lowest production costs can only be achieved by high volume equipment which is extremely costly and which can only be justified on the basis of prospects of high utilisation without which the potential savings will not be realised. The realisation of economies of scale is not only a precondition of the lowest prices for the home market but is also the key to expanded exports. BLI (and Thorn before it) has been in the forefront of exports, and the merger reduced the disparity in size between the largest unit in this country and the major international competitors. BLI claims that it is efficient and progressive and that its share of the production and supply of reference lamps is not, nor may it be expected to be, against the public interest.

Complaints

621. BLI has already covered in its main representations the subject matter of a number of the observations of distributors and users included in chapters 8 and 9 which may be critical of the arrangements of the principal manufacturers, including BLI. A few of its replies to certain individual observations are summarised in the following paragraphs.

622. *A number of local authorities* (see paragraph 454). BLI rejects the suggestion that the industry is not fully competitive; it says that it is, indeed, the free competition between similar products which produces level prices and discounts in the case of main brands. As regards comments from these buyers about the absence of quantity discounts, BLI says that it is fully alive to the advantages of a discount structure which gives incentives to bulk buying. Between 1957 and the end of 1959, the members of ELIC gave local authorities quantity discounts on a scale ranging from an additional $2\frac{1}{2}$ per cent for orders of at least £50 to $7\frac{1}{2}$ per cent for orders of £250 and over. This system proved unpopular with local authorities; some order under contract as and when required and others found difficulty in making up orders large enought to qualify for quantity discounts. Others, again,

who subcontracted street lighting installations to electricity boards, received no quantity discounts and felt this to be unfair. In these circumstances, and in the climate of strong competition between wholesalers, wholesalers habitually quoted prices which reflected the maximum quantity discount rate, whether earned or not. The quantity discounts were accordingly abolished by the members of ELIC in 1960 and were replaced by improved status discounts. In introducing its new discount structure in April 1967 BLI did not feel able to include quantity discounts for local authorities in view of its experience of their unpopularity.

623. BLI says that there is no agreement between it and any other manufacturer as to the discount structure or classification key. It is true that it does adhere to its published structure; to do otherwise would be impracticable because it would involve competing with its wholesalers and would lose their custom. In so far as tenders are based on the discount structure and classification key, they will be the same for the reasons BLI has already stated.

624. BLI does not agree that the level of prices is high. In the case of main-brand GLS lamps and discharge lamps, net prices to all local authorities are lower than they have ever been. As regards the gap between main brand prices and second brands, whether of ELIC members or others, second brands have a more restricted distribution and do not command the same price.

625. *A distributors' association* (paragraph 399). BLI does not agree that discounts granted to large users and contractors are excessive, and says that this complaint is strongly coloured by the trade interest of the association concerned.

626. *A distributors' association* (paragraph 413). On the question of the minimum quantity of twenty-five introduced in April 1967, BLI says that from the point of view of the smaller retailer, the quantity of twenty-five applies only to the commonest GLS lamps. It is so small that any retailer should be able to buy in this quantity, the cost of which to him is only about £2, including purchase tax.

627. *An electrical contractor and two local authorities* (paragraph 421 and paragraph 454). As regards variable quality, BLI says that stringent measures are taken by it during and after manufacture to ensure proper quality control. BLI applies tests in accordance with BS 161 on the whole of its main brand GLS production, and carries out similar tests on the whole of its production of other lamps. Random test purchases are made of main-brand GLS lamps on behalf of BSI and if the BS test requirements are not met for any batch of lamps so purchased the matter is raised with BLI; any persistent failure would result in the revocation of BLI's BSI licence. Because of the necessarily limited number of lamps tested, some lamps without being faulty are bound to be outside the specification limits laid down by BSI. Other apparent faults in lamps can arise from incorrect use by the customer in the wrong fitting; by the use of a lamp at a voltage for which it is not designed; and by variations in the supply voltage. BLI is not infallible in detecting lapses from the proper quality standard but it does all in its power to ensure that its products live up to their good names.

628. *A wholesaler* (paragraph 405). As regards the comment on the variation in the colour definition of fluorescent lamps between one manufacturer and another, BLI says that the most commonly used colours, and some other colours, are the subject of BSI specification. To narrow the tolerance permitted by the specification so that variations between the products of different manufacturers ceased to be visually detectable would not be practicable.

629. *A large user* (paragraphs 460 and 462). BLI says that it can confirm categorically that at no time was there any consultation with ELIC or with other members of ELIC about the rate of discount to be allowed to this user. The user's statement of total lamp purchases was accepted as a true representation of its purchasing capacity, and the delay in according it the appropriate terms was due to the transfer of the commercial headquarters of AEI L & L from Leicester to London, when the application was overlooked. The user's statement that its application was made 'through AEI L & L who in turn communicated with ELIC who agreed to increase our discount' is incorrect. BLI says that, although the ELMA and ELIC discount arrangements have long since ceased, many buyers, including apparently this particular user, continue to ascribe erroneously to ELIC what is, in fact, the individual decision of a lamp manufacturer.

III: The Submissions of the Distributors' Associations

630. We invited the EWF, the NFI and the RTRA to comment on a number of matters arising from the practice of distributors of generally following the resale prices and discounts recommended by the principal manufacturers in respect of their main brands of reference lamps.

631. *The EWF*, whose reply is dated 7th September 1967, says that it does not necessarily accept that wholesale distributors do comply generally with the recommendations of the principal manufacturers. It says, however, if the premise were to be accepted, there exists within the EWF two differing schools of thought on whether or not compliance with recommended prices and discounts leads to undue rigidity and high costs in distribution, and results in artificially high prices to the consumer.

632. The EWF says that some members consider that manufacturers' recommended resale prices are lower and discounts are higher than those which wholesale distributors would charge their customers if no such recommendations existed. Enquiries made by the EWF in the past had shown that the realised wholesale margin on lamps was relatively low. If the recommended resale prices and discounts were to be withdrawn then, where competition made this possible, wholesale distributors would be able to charge higher prices to their customers; presumably this would result in higher prices to the ultimate consumer. When discounts and prices are recommended they are known to the customers and, although the wholesaler is perfectly free to charge more than the recommended resale prices he cannot, in practice, do so because the customer knows the recommended resale price and is not prepared to pay more.

633. On the other hand, there are members who consider that the recommendation of prices and discounts by manufacturers does impose rigidity and can result in artifically high prices to the eventual consumer. These members consider that wholesale distributors should set their own trade discounts to their customers without guidance from manufacturers. They consider that this free competition would result in lower prices to the consumer.

634. It is generally considered that the only way that a manufacturer can relate recommended resale prices and discounts to a customer's total purchases of lamps from all sources is by making an estimate of potential purchases available from that customer. In settling his own discount pattern (whether or not recommendations are made by a manufacturer) a wholesale distributor can only apply a similar

yardstick. The EWF does not consider that this practice affects prices one way or another.

635. The EWF does not consider that the practice of manufacturers of recommending resale prices and discounts which are identical contributes to high costs and results in artifically high prices. It believes that competition exists between manufacturers to a very considerable degree at technical level, and that any manufacturer who is able to reduce his costs by the introduction of technical innovations can bring about a reduction in the price of the particular type of lamp concerned. The competition in the particular type is such as to force his competitors to fall into line with the prices which the innovator sets.

636. The EWF does not consider that the margins recommended by the principal manufacturers for wholesalers are high; on the contrary, they are relatively low. It says that some of the margins recommended by manufacturers for various other classes of customers are higher than those which wholesalers would grant those customers in a free market.

637. The EWF says that it has not conducted a questionnaire of the total membership to formulate a reply to the Commission's inquiry. The views expressed above are submitted by the Lamp and Lighting Fittings Committee, through the Council, as representative of the various types of membership, and are based on such information as is available as a result of discussion and correspondence with other members.

638. *Lawson Turnbull and Co. Ltd., Aberdeen,* an individual member of the EWF which does not follow the standard terms recommended, wrote to us direct in August 1967 to say that it felt that the views of some members, including its own, would be very different from those given in the EWF's reply. The company considers that the practice of lamp manufacturers all having the same resale price and discount structure is bound to result in artifically high prices to the eventual consumer. What in the past may have been an agreed structure is now based on price leadership which creates even greater rigidity. Competition has always been the life blood of trade, and there is no competition in the lamp industry. Since 1st April 1967, when BLI introduced a new trading structure, without prior consultation with the EWF, the profit margins as recommended by it were greatly reduced, but with no corresponding reduction in price to the general public. No other manufacturer is now willing to consider stepping out of line by making an individual arrangement.

639. Lawson Turnbull says that it is not claiming that the practice of lamp manufacturers of relating discount to total purchases from all sources is unfair, but that their practice in laying down recommended resale prices leads to high discounts to somebody along the line of distribution and does not help the eventual consumer. It suggests that a freer market would reduce consumer prices and that the practice of price leadership which the manufacturers have set up is, therefore, contrary to the public interest. All goods, including lamps, should be open to free competition in a non-resale price maintenance community. When the manufacturers lay down their selling price to distributors, they ensure their own profit margin (and in a competitive market it would be small), but there their control of price should end.

640. *The NFI,* whose reply is dated 25th September 1967, says that it is very convenient to work to a price list for ordering, pricing and selling lamps, and that

this saves time. Its members feel that if net prices were to be adopted, higher margins would be needed to cover the extra labour involved in pricing, coupled with the extra care required in handling such fragile items. In the absence of a recommended selling price known to the public, the NFI would expect a tendency for retailers to raise their profit margins, particularly on a wide range of decorative types of lamps not normally sold by cut-price stores, to compensate for the inadequate margins which apply to lamps and other electrical goods, especially since the introduction of SET.

641. The NFI suggests that no one compels a customer to purchase particular brands of lamps. The customer has complete freedom of choice, and many brands are available which offer a wide choice of prices to the consumer. Cut-price stores generally select lines with a quick stockturn. Lamps, for example, might be limited to 25, 40, 60 and 100 watts in 240 volts, in pearl or clear, or both. On the other hand, in order to give adequate service to the public, other retailers carry a wide range of lamps; for example, one member had submitted a stock list of ninety-seven types of lamps, which meant a comparatively slow stockturn. As long as the customer wants to purchase single lamps of all wattages as at present, the NFI's members would say that the margins are too low; to service such needs it is necessary to stock a wide range of lamps taking up a considerable amount of stocking and selling space in comparison to their value, all being very fragile, with breakages and non-starters, and each one sold having to be tested, taking up time and money. The NFI says that, as an association, it believes in private enterprise and fears that the abolition of recommended retail prices could be a death blow to many of its smaller members.

642. *The RTRA*, whose reply is dated 1st February 1968, says that its members regard the sale of electric lamps a very marginal matter. It is undoubtedly true that, collectively, its members must sell a very considerable quantity of lamps; but the retailer's attitude is, largely, that he supplies these lamps as a service to his customers. For the most part, retailers are anxious to have recommended prices on lamps as this does away with the necessity of having to price the goods themselves. Few retailers seek competitively for cheaper sources of supply of lamps; and few, consequently, give discounts to the public. The discount market is largely in the hands of the supermarket and the chain store. The RTRA says that it does not seek to establish any market leadership in the sale of lamps; with larger appliances and television sets the matter is, of course, very different for its members.

IV: The Submissions of certain Shareholders in the Controlled Companies

643. BLI, Crompton and Osram elected to make joint written representations to us in respect of certain matters notified to them, and to Philips, individually, as shareholders in the Controlled Companies, and they attended a hearing in January 1968 for the purpose of discussing those matters. Their representations are summarised in paragraphs 647–657 where, for convenience, they are referred to as 'the Shareholders' to distinguish between them and the shareholders generally, including Philips.

644. In its separate reply Philips told us that, as a shareholder in the Controlled Companies, it is represented on the Management Committee and had had the opportunity of considering the joint written representations of BLI, Crompton and Osram. It says that, as a small shareholder, it exercises small responsibilities

and powers in relation to the Controlled Companies and the Management Committee; and that, in any event, it would be surprising if the three major manufacturers were to achieve a unanimity of view on the position of the Controlled Companies and on the market in which they operate solely because of a common interest as shareholders. Philips says that the representations made by BLI, Crompton and Osram jointly, in writing and at the hearing, should not be regarded as a reply by Philips to the matters relating to the Controlled Companies which we raised with all four shareholders.

645. The Shareholders explained that their representations apply only to three of the Controlled Companies, Ismay, Britannia and Splendor, which comprise one production unit and a largely integrated sales organisation. References to 'the Controlled Companies' in the following paragraphs do not, therefore, apply to Evenlite and MSL. The Shareholders say that Evenlite supplies lamps almost entirely to the shareholders and is more properly to be regarded as a jointly-owned manufacturing concern. MSL is a non-manufacturing concern, dealing only in non-reference lamps.

646. The Shareholders say that the 'cheap lamp market' in which the Controlled Companies operate means the market for all brands of lamps other than the main Elasta. Cryselco and Crompton; and that this definition is understood in the trade. The other brands are very numerous, but may be grouped as follows:

(i) lamps which retail at the same or virtually the same price as main brands, but which are available to wholesalers, retailers and trade users at higher rates of discount than main brands;

(ii) lamps which retail at a lower (by approximately 20 per cent) price than main brands and which are (a) sold to the trade at lower discounts from list prices than category (i) or, and mainly, (b) at net prices;

(iii) lamps which are sold to the trade under customers' own brand names at negotiated net prices. These, like category (ii), retail at lower prices than main brands.

647. The Shareholders say that there is virtually no physical difference between any brands of lamp of the same type and size, although all lamps sold by the Controlled Companies have single-coil filaments. There being now no resale price maintenance applicable to any electric lamps the retail price of any lamp is a matter for the retailer. In practice, however, retailers at present tend to follow the manufacturers' recommended retail prices. There are no recommended retail prices for customers' own brands. The cheap lamp market now accounts for approximately 40 to 45 per cent, by number, of the total home market in GLS lamps; and of the cheap lamp market the Controlled Companies have at present about 30 per cent by number. The Shareholders accept that the Controlled Companies' share of the total market in GLS lamps has dropped from 25 to 30 per cent in 1951 to about 13 per cent, but they point out that the size of the market has greatly increased since 1951 and the Controlled Companies' sales have risen from 26·7 million in 1951/52 to 31 million in 1967/68.

648. The position in the market for electric lamps and, in particular, in the cheap lamp market has changed radically since 1951. Then there was common pricing by agreement between the ELMA members; the Controlled Companies, which operated outside this arrangement, were then, as now, owned by sharehoders (although differently constituted) in competition in a cheaper market with

several independent manufacturers. The Commision said in its 1951 Report that the preservation of the Controlled Companies as competitors would become even more important if ELMA or its members were to absorb any of the independent manufacturers; and it recommended that, if that were to happen, or if the Controlled Companies ceased to practise an independent price policy, the position of these Companies should be reviewed in the light of the situation as it would then exist. The possibility envisaged by the Commision that the major manufacturers might acquire several of the independent manufacturers has now occurred and, in the field of GLS lamps, there are left only two independent manufacturers, British Luma and Maxim, the former being concerned almost entirely with sales to co-operative societies and the latter being very small. There is a larger number of independent manufacturers of fluorescent lamps but, although growing, their sector of this market is at present comparatively small. So far as the Controlled Companies are concerned, fluorescent lamps form only a small proportion of sales; they do not manufacture any fluorescent lamps, but buy their ad hoc requirements from a variety of sources, including independent manufacturers.

649. Over the years three of the four large manufacturers, originally GEC, AEI, Philips and Crompton, have acquired or merged with all the independents in the GLS field other than British Luma and Maxim, so that each of them is now (in its own right or through a subsidiary) actively engaged in the cheap lamp market. The brands of these large manufacturers which they sell in the cheap lamp market are:

BLI	Omega, Nura, Vesta
Philips	Corona, Luxram, Star, Kingston, United and Insular
Osram	Ascot
Crompton	Hygrade

The Vesta brand is supplied exclusively to Woolworth. The manufacturers also sell many customers' own brands. The function of the Controlled Companies is to compete in the cheap lamp market, no longer primarily with independents but with individual shareholders, and this they have done, and continue to do so. The cheap lamp market is highly competitive, and the price level is dictated by the competition between individual shareholders which the Controlled Companies in their turn, have to meet.

650. In 1951 only Crompton of the shareholders was engaged in the cheap lamp market. By 1963 Philips also had an interest in this market, through Corona. It was not until July 1964 that Omega and Astralec (which sells Vesta), already owned by Thorn, became part of BLI and thus within the shareholding interests, and not until 1965 that GEC acquired Ascot. It is therefore only since 1965 that all the shareholders have had individual interests in the cheap lamp market. The present position therefore is that:

(i) the major companies compete individually in the cheap lamp market;
(ii) they also have a joint interest in the Controlled Companies which as a unit competes with each individual shareholder;
(iii) there is little independent competition.

651. In 1963 the shareholders felt it necessary to consider the re-organisation of the Controlled Companies. Much of the plant was old and production costs were rising. The object of the re-organisation was to improve the efficiency and competitiveness of the Controlled Companies. Of the several courses open in the

context, the one chosen had regard to the fact that the shareholders themselves had surplus production capacity available to supply part of the requirements of the Controlled Companies. Rather than modernise the Controlled Companies' production to the extent necessary to enable them to continue to produce their total sales requirements, it was decided to modernise upon a more limited production basis and to make arrangements for the balance of requirements to be supplied by the shareholders, thereby utilizing their own surplus capacity. Capital expenditure was thereby contained, and use was made of existing efficient production capacity. The Shareholders maintain that this was in the circumstances a proper commercial decision.

652. At the time the re-organisation of the Controlled Companies was being considered only Philips and Crompton were engaged in the cheap lamp market, and these only to a limited extent. It was, therefore, only through the Controlled Companies that Osram and AEI had access to that market. The formation of BLI in 1964 and the acquisition by GEC of Ascot in 1965, together with the expansion of Philips' interests in the cheap lamp market by the acquisition of controlling interests in Luxram and Kingston in 1965 and 1966, respectively, changed that position but by then the proposed re-organisation had been agreed and put into operation. Concentration of production was to be achieved by the sale of the Splendor factory and the regrouping of plant. Production of reference lamps was to be at the Park Royal factory, and some reference lamps and all automobile lamps at Ilford. The decision to concentrate GLS production at Park Royal was taken upon information as to production costs at that factory which was, in fact, inaccurate, being based upon defective accounting methods. It soon became apparent that costs at Park Royal were in fact higher than the information had suggested, and a growing labour shortage in the area militated against efficient manufacture. It then became necessary to close the Park Royal factory and concentrate all production at Ilford. This prolonged the unsettled period of reorganisation and was unfortunate for the Controlled Companies in that the benefits hoped to be achieved by the re-organisation were delayed. It is not a matter, however, for which the Shareholders' Management Committee or the Directors of the Controlled Companies should be blamed.

653. The Shareholders say that it is only since August 1967 that the Ilford factory has become operative as the sole production unit of the Controlled Companies; and that in spite of increased labour and material costs, production costs have already improved. It is not yet possible to estimate with any accuracy likely average costs in the longer term but, now that the re-organisation has been completed, serious attention is being paid to the possible reduction of administrative costs. With the exception of sales to Woolworths all other sales organisation is now coordinated and all Ismay and Splendor brands are sold by one sales organisation and the customer is offered the particular brand most related to his needs in terms of price, pack or quantity. There being no physical differences between the brands of lamps sold, the distinction between one brand and another is one of service or terms and manner of supply.

654. A substantial proportion of the Controlled Companies' total GLS sales are at present made to Woolworth under the brand name 'Sunshine'. Woolworth is a very large buyer of electric lamps, particularly in the cheap lamp market. Since the earlier 1950's it has preferred to divide its requirements between two suppliers; before that it bought solely Sunshine lamps. The Shareholders point out that the Controlled Companies held their present share of the Woolworth

trade in a highly competitive market. In August 1967, the prices paid by Woolworth for both 'Vesta' and 'Sunshine' lamps were reduced and the successful future of the Controlled Companies clearly depends in part upon their ability to remain competitive in this market. Any change in Woolworth's purchasing pattern (either by BLI obtaining a larger share or by the entry of other shareholders) which resulted in a smaller share of that market accruing to the Controlled Companies would be seriously adverse to them. Their present competitiveness enables them to retain a substantial share of that market.

655. The Shareholders say that, apart from questions of major capital expenditure, the Controlled Companies are largely autonomous. Their brief is to operate competitively and profitably in that sector of the lamp market in which they are concerned, and this they are given a free hand to do, and are doing. The Shareholders do not restrict the relative independence of the Companies or their ability to compete effectively in their particular sector of the market. With the concentration of manufacture in one factory there have been improvements in production costs, and it is believed that these compare favourably with other lamp makers relative to overall capacity, the markets in which they are selling and the limited number of types they are producing. The shareholders provide, and intend to continue to provide, technical assistance to enable the Companies to operate upon the most efficient basis: this is being done through the Management Committee which was reconstituted with this objective in October 1966. Technical advice and assistance in particular, is given through a Sub Committee. Matters of overall policy are, where necessary, submitted to a meeting of the Shareholders' Commercial Representatives. The administration of the Controlled Companies remains however, in the hands of their Board of Directors. Two of the shareholders, BLI and GEC, are now represented on the Board of Ismay. During the re-organisation the arrangement for the supply of lamps by the shareholders approximately in the proportion of their respective holdings, and at a price equivalent to the Controlled Companies' cost of manufacture at the time the price was agreed, provided considerable assistance towards stability of costs and supply since, during this unsettled period, production by the Controlled Companies was disrupted and the actual production costs of the Controlled Companies were higher than the price of lamps supplied by the shareholders. Supply by the shareholders thus assisted towards the continuance of effective competition by the Controlled Companies during this period. The Shareholders claim that this arrangement does not tend to discourage efficiency, but encourages it. The more the Controlled Companies can reduce their own production costs the more likely it is that the price at which they can purchase their additional requirements from the shareholders will be reduced. The arrangement is advantageous to the Controlled Companies in several ways. First, they are able to regulate their purchases to suit their requirements more easily and more economically than if they had to adjust their own level of production to suit fluctuating demand. Secondly, the shareholders are more tolerant towards cancellation of orders than would be the case if there were no shareholding interests. (In the year to March 1968 purchases from shareholders are being cut back to under 5,000,000 lamps.) Thirdly, the Controlled Companies have an assurance of supply of their requirements from the four shareholders together which is greater than would be the case if the Controlled Companies were dependent upon one or two suppliers. Fourthly, the Controlled Companies are at the same time placed at no economic disadvantage by reason of not manufacturing their total requirements themselves. The Shareholders maintain that, in the particular

context of the electric lamps industry, the shareholders' practice of supplying prices that are agreed between them is reasonable and commercially justifiable. The relative independence of the Controlled Companies and their ability to compete effectively is not thereby restricted nor is efficiency discouraged; the arrangement is, on the contrary, beneficial to the Controlled Companies and assists them in operating competitively and profitably in their sector of the market. Although the arrangement is only marginally profitable to the shareholders themselves, it nevertheless enables them to utilise capacity which might otherwise be surplus.

656. In general, the longer runs of production are manufactured by the shareholders and the shorter by the Controlled Companies themselves. The Shareholders say that this is a sensible arrangement which enables each to do that for which it is best fitted; in particular, the Companies' requirements for a multiplicity of customers' own brands are best carried out by the Companies themselves.

657. Each of the shareholders is competing in the cheap lamp market and the level of competition is determined by the individual operations of the shareholders. So long as the Controlled Companies remain a competitive force and are engaged profitably in that market they fulfil a useful function. As a result of the re-organisation the Controlled Companies have now been placed in a position in which they are prospectively better able to carry out their competitive function. The Shareholders say that it is not in their interests that the Controlled Companies should cease to be such a competitive force. The Controlled Companies offer continued competition in the cheap lamp market, and remain a competitive force in that market which seeks to meet the needs of the users and distributors whose considerations are mainly those of price; there is nothing in their operation or control which is, or may be expected to be, against the public interest.

APPENDIX 1

The Electric Lamp Interests of Associated Electrical Industries Ltd. and Thorn Electrical Industries Ltd. between 1951 and the formation of BLI in 1964

Associated Electrical Industries Ltd. (AEI)

1. In 1951, AEI had three wholly-owned subsidiaries concerned with the production and/or sale of reference type lamps:

(i) *The British Thomson-Houston Co. Ltd.* (*BTH*) owned and operated the major lamp factories and related research and development establishments; it had its own selling organisation. Lamps were sold under the 'Mazda' brand name.

(ii) *Edison Swan Electric Co. Ltd.* (*Ediswan*) owned and operated one lamp factory and had its own selling organisation. Lamps were sold under the 'Royal Ediswan' brand name.

(iii) *Metropolitan-Vickers Electric Co. Ltd.* (*MV*) neither owned nor operated a lamp factory but had its own selling organisation which drew supplies from the factories of BTH and Ediswan. Lamps were sold under the 'Metrovick' brand name.

2. AEI's home sales of electric lamps in 1952 and in 1964 were as follows:

		1952 (£'000)	1964 (£'000)
Incandescent		1,675	2,805
Fluorescent } Discharge }		592	919 691
	Total	2,267	4,415

3. In 1952 AEI and its subsidiaries had shareholdings in 19 other companies concerned with reference type lamps at home and overseas. These included interests ranging from 32 to 34 per cent in each of the five Controlled Companies (see chapter 6), 50 per cent interests, with GEC as the other party, in the component companies, Lamp Caps Ltd. and Glass Bulbs Ltd. (see chapter 7), and interests in the Westlake Bulb Machine Syndicate Ltd., and in the electrical wholesalers, Stearn Electric Co. Ltd. It had an 11 per cent interest in another electrical wholesaler, Z Electric Lamp & Supplies Co. Ltd. It had an interest in a lamp manufacturing company in Norway; and interests, with the principal ELMA companies, in lamp manufacturing companies in India, South Africa, Australia and New Zealand. It had a three per cent interest in SA Phoebus, Geneva and a 28 per cent interest in the Electric Lamp Statistical Office where the post-Phoebus quota arrangements were carried out (see chapter 3).

4. In 1955, AEI began a reorganisation of its lamp business which was not completed until 1960. In January 1955, Ediswan's lamp factory was transferred to BTH and its sales organisation was integrated with that of BTH. In the same year, a dormant subsidiary of BTH became AEI Lamp and Lighting Co. Ltd. (AEI L & L), by change of name. Also in the same year, AEI acquired Siemens Bros. & Co. Ltd. with its wholly-owned subsidiary Siemens Electric Lamp & Supplies Ltd. (SELS) through exchange of shares of which the Siemens' stock was valued at £7·3 million. SELS had its own lamp factories and sales organisation, and had shares in most of the companies noted above. Its sales of electric lamps of all types in 1955 totalled £810,000. The acquisition of the lamp investments of SELS served to increase AEI holdings in a number of the companies noted above; in particular, AEI's interests in the Controlled Companies were increased to 43 or 44 per cent. By 1960, following a number of internal transactions, the whole of AEI's lamp interests were owned and managed by AEI L & L, although certain research continued to be carried out by BTH under contract. As part of the reorganisation, the shareholdings noted above were transferred to AEI L & L, with the exception of Westlake Bulb Machine, which remained with AEI. In 1958, AEI acquired a 9 per cent interest (subsequently transferred to AEI L & L) in the lamp company Solus Teoranta in the Republic of Ireland, in which GEC and Crompton also had interests.

5. In 1959 British Sealed Beams Ltd. (BSB) was formed, in which AEI L & L held 40 per cent of the equity and 50 per cent of the voting shares; GEC held 20 per cent of the equity and the other 50 per cent of the voting shares; and Lucas held 40 per cent of the equity. BSB is concerned almost entirely with automobile lamps; reference lamps (floodlights, spotlights etc.) account for only about four per cent or less of its sales.

6. In 1959 AEI and GEC began negotiations for the integration, into two further jointly owned companies, of such of their lamp component operations as were not already managed by Lamp Caps and Glass Bulbs. These negotiations led to the formation in 1961 of Glass Tubes and Components Ltd., Chesterfield and Lemington-on-Tyne, and Lamp Metals Ltd., Wembley. From time to time in the 1950's and later, there were abortive discussions between AEI and GEC about a complete merging of their respective lamp and lighting interests; the last such discussion took place in 1963, that is, not long before the merger of the lamp and lighting interests of AEI and Thorn in the spring of 1964. (There had also been some earlier merger discussions between AEI and Thorn in 1962.) AEI and Thorn already had a jointly owned company for the production of radio and television valves and tubes. AEI had a long standing agreement with Osram GmbH, GEC (USA) and NV Philips for the exchange of patents, technical assistance and know-how. These arrangements raised certain difficulties in connection with the merger of AEI's and Thorn's lamp and lighting interests. AEI's agreement with Osram GmbH ended in 1966, although BLI (through AEI L & L) continues to benefit from the German Osram patents.

Thorn Electrical Industries Ltd. (Thorn)

7. The Thorn electrical business was started in 1928, and became a public company, Thorn Electrical Industries Ltd., in 1936. The business expanded rapidly in the war and post-war period and by 1951 its lamp business was similar in size to the medium sized ELMA companies. In 1949 it had acquired from E. K. Cole Ltd. a controlling interest (51 per cent) in Ekco-Ensign Electric (Ekco). The output of the two companies of GLS and fluorescent lamps was substantial and production was highly mechanised. Thorn, in particular, had installed modern mechanised plant for fluorescent lamps and claimed the highest output of these types in the United Kingdom. The greater part, by quantity, of its production of fluorescent lamps at that time was exported.

8. Thorn's sales of reference type lamps in the home market and for export in the years ended March 1952 and March 1964 were approximately as follows:

	1952 (£'000)		**1964** (£'000)
INCANDESCENT		INCANDESCENT	
Home	1,105	Home	2,821
Export	150	Export	372
	1,255		3,193
FLUORESCENT		FLUORESCENT	
Home	315	Home	1,934
Export	347	Export	1,037
	662		2,971
Total	1,917		6,164

9. In 1952 Thorn had four factories in the United Kingdom making reference type lamps—Enfield, Tottenham, Edmonton and Merthyr Tydfil. It also managed the business of Ekco, including the company's factory at Kent Street, Preston, and Ekco was, in practice, then a selling company only. Thorn had four United Kingdom wholly-owned subsidiaries concerned with lamps:

(i) *Smart & Brown (Engineers) Ltd.* manufacturers of auxiliary gear and accessories for use with fluorescent tubes and discharge lamps.

(ii) *Lamp Presscaps Ltd.* manufacturers of lamp caps and other metal products for which similar manufacturing techniques were required.

(iii) *Atlas Lamp Works Ltd.* which was dormant.

(iv) *Electric and Radio Appliances Ltd.* which was dormant, apart from a short period between 1952 and 1964 when it supplied 'Vesta' brand lamps to *Universal Distributing Co. Ltd.* for resale to Woolworth (see paragraph 13). It was also used for a time for the supply of specially branded lamps to a large chain and for occasional disposal of surplus stocks.

Thorn also had subsidiary companies in South Africa, Australia and New Zealand.

10. Between 1952 and the formation of BLI in 1964, the following undertakings concerned directly or indirectly with reference type lamps were acquired (wholly or in part) or were established by the company or commenced trading having been dormant:

(i) *Manifold Machinery Co. Ltd.* Before 1952 Thorn had designed its own specialised machinery. Amongst those who contracted for the manufacture of the machinery was Manifold, an independent private company which specialised in this field. In 1955 Thorn, which had previously acquired an interest in Manifold, acquired the entire shareholding.

(ii) *Omega Electric Lamp Works Ltd.* formed in 1918, was a private company manufacturing and selling a simplified range of GLS lamps for the cheap sector of the market, in which Thorn wished to compete. Thorn acquired the business in 1957, through nominees.

(iii) *Atlas Lighting Ltd.* In 1957 all the selling activities of the 'Atlas' brand goods were concentrated in this company (formerly Atlas Lamp Works Ltd.) which had been dormant. (It was this company which, by change of name, became BLI in June 1964.)

(iv) *Tucana Ltd.* In 1960/61, for reasons which are said to have had no connection with reference type lamps, Thorn acquired an interest of just over 50 per cent in this investment holding company. Tucana holds a controlling interest (63·98 per cent) in Z Electric Lamp & Supplies Co. Ltd. and has a wholly-owned subsidiary, Lawrence & Nicholas Ltd.; both these companies are electrical wholesalers. (In 1960/61 AEI L & L and GEC each had a 10·5 per cent interest in Z Electric.)

(v) *Astralec Electrical Industries Ltd.* was incorporated in 1962 as a wholly-owned subsidiary of Thorn to acquire the assets and business of *Apex Electrical Co. Ltd.* together with rights in the trade name 'Vesta'. Apex Electrical was concerned solely with the supply of lamps to Woolworth (see paragraph 13).

(vi) *AES Wholesale Ltd.*, an electrical wholesaler, in which Thorn acquired a 10·5 per cent interest in April 1962.

Between 1952 and 1964 Thorn established additional overseas connections, including a distributing company in Western Germany, a controlling interest in a privately owned Italian lamp manufacturer (SIVI), and distributing companies in Scandinavian countries.

11. Reference type lamps and machinery and associated patents were included in the scope of agreements between Thorn and Sylvania Electric Products Inc. USA, covering interchange of technical assistance, patent licences and know-how.

12. In 1955 Thorn and Philips concluded an agreement, the primary object of which is said to have been a move towards rationalisation of production whereby each company would concentrate on certain types of lamps. We understand that the agreement never came into effect, and was cancelled by mutual consent in 1957. In January 1959 an agreement between AEI L & L, Crompton, GEC, Philips, Siemens (later merged into AEI L & L) and Thorn was registered with the Registrar of Restrictive Trading Agreements. It related to tenders to bulk buyers for discharge and/or filament lamps for amounts exceeding £100,000. Each party agreed to notify an appointed independent accountant of the prices he intended to quote. The accountant was then to collate the prices of all the parties and supply each with a schedule showing the lowest price notified for each item. It was agreed that no party should quote a higher price than that notified or a lower price than shown in the schedule. The agreement was terminated in October 1959.

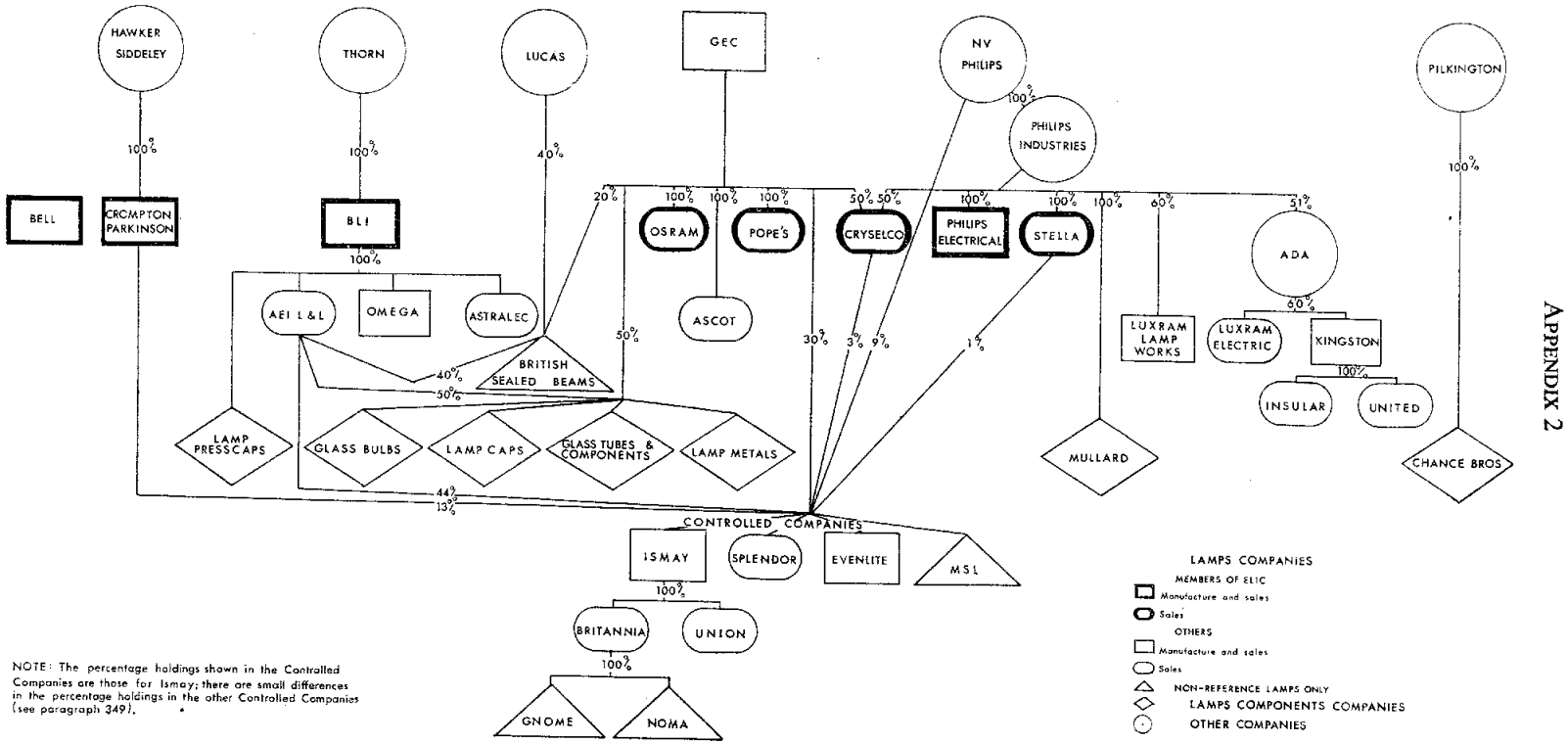
13. In about 1954 Thorn started to manufacture 'Vesta' brand lamps which it supplied to the Vesta Lamp Co., which resold the lamps to Woolworth. Up to that time Britannia had for many years supplied all Woolworth's requirements of lamps, under the brand

name 'Sunshine' (see chapter 6). In 1958 Apex Electrical started to make 'Vesta' lamps with plant and premises rented from Universal Distributing. In 1959 Apex Electrical started production of 'Vesta' lamps and ceased to buy from Thorn. In 1962 Thorn bought Apex Electrical and formed Astralec (see paragraph 10) to handle the 'Vesta' lamp business. Universal Distributing acted (and continues to act) as selling agent for the lamps, for a fee and commission.

14. Although Thorn's list prices were the same as those of the ELMA members in 1951, in 1956/57 Thorn's discounts (and those of Philips which had resigned from ELMA in 1955) were higher than those of the ELMA members. Thorn was a founder member of ELIC which was formed in 1957 and which operated a 'Recommended Non-Mandatory Discount Structure' until the end of 1959. The ELIC discount structure brought Thorn's (and Philips') terms into line with those of the other members of ELIC.

15. An account of the merger of AEI's and Thorn's lamp and lighting interests and the formation of BLI in 1964 is given in chapter 5.

Chart Showing the Members of ELIC and their Connections with Other Companies in the Electric Lamps Industry



NOTE: The percentage holdings shown in the Controlled Companies are those for Ismay; there are small differences in the percentage holdings in the other Controlled Companies (see paragraph 349).

APPENDIX 3

The Interests of Thorn, GEC and Philips in Distributors Handling Reference Lamps

	Percentage shareholding
Thorn	
WHOLESALERS	
John T. Cartwright & Sons Ltd.	100
Foster Electrical Supplies Ltd. (Subsidiary of Metal Industries Ltd.)	100
Gothic Electrical Ltd.	100
Lawrence & Nicholas Ltd. (Subsidiary of Tucana Ltd.)	100
Wessex Wholesale Electric Ltd.	100
Z Electric Lamp & Supplies Co. Ltd.	74·5
Stearn Electric Co. Ltd.	50
AES Wholesale Ltd.	10·5
RETAILERS	
Circle Electrics Ltd.	100
Domestic Electric Rentals Ltd.	100
Multi-Broadcast (Rentals) Ltd.	100
Tucana Ltd.	100
White & Swales Ltd.	75
GEC	
WHOLESALERS	
Stearn Electric Co. Ltd.	50
Z Electric Lamp & Supplies Co. Ltd.	10·5

Philips

Philips Industries had at 1st July 1968 an interest of approximately 51 per cent in ADA (Halifax) Ltd. which, in turn, has a controlling interest in the following distributor groups:

WHOLESALERS

Amalgamated Wholesalers Ltd.
Hathaway Electrical Ltd.
James Robertson (Factors) Ltd.
Robshaw Brothers Ltd.
Silcocks Bros. (Bristol) Ltd.
Wholesale Supply (Stoke-on-Trent) Ltd.

RETAILERS

Alexanders Distributors (Aberdeen) Ltd.
H. Bernard & Co. (Electrical) Ltd.
W. R. Boot & Son Ltd.
Leonard S. Dyer Ltd.
R. W. Proffitt Ltd.
Retada Holdings Ltd.
Stirling Hunter Ltd.

APPENDIX 4

Electric Lamp Industry Council Ltd.

Notification of New Lamp Developments

A new lamp development is defined as the introduction of a lamp as a separate item in a Member's stocks and also one which features separately in catalogues, leaflets, etc.

1. **Method of notification**

In the interests of electrical and mechanical interchangeability it is highly desirable that advance notification of such developments is given to other Members in the following manner:—

(a) In the case of lamps which the Member wishes to test on the market (either for technical reliability of product or consumer acceptance).

(b) Those where no tests are considered necessary e.g. those that are modifications to or replacements for existing types.

Four months notification to other Members of intent to market giving details of the lamps involved and if field tests are to be undertaken the following additional information supplied:

(i) The area covered.
(ii) Commencement date (i.e. at least one month after notification date).
(iii) Duration of tests.
(iv) Number of lamps involved.
(v) Type of test envisaged.

2. **Changes to design, etc.**

If as a result of the field tests, changes are made to this new lamp development other Members to be notified of the changes.

3. **Similar lamp developments**

Any manufacturer who has developed a similar lamp to that undergoing field trials but considers that no such trials are required for his product, will give four months notification of his intent to market, one month after the notice of the original announcer.

4. **Specialised lamps**

The foregoing arrangements regarding field tests will not apply in the case of specialised lamps, e.g. some projector types which are developed in co-operation with a particular apparatus maker. In such instances, however, before the lamp is generally marketed, a four months notification period will be required.

5. **Publicity**

No public announcement of a new lamp development shall be made by the initiating Member before four months after notification date.

Where the Member, due to the announcement, by an outside competitor, considers it necessary to publicise, by any means, the fact that he has a similar product that he wishes to market in the future (not earlier than four months), he will then give one week's notice to other Members of his intention to announce a new lamp development. This is not an indication of an intention to stock and market; these conditions being covered under (a) and (b) above.

1st June 1966

APPENDIX 5

Electric Lamp Industry Council Ltd.

Technical Committee: Terms of Reference

1. **Function**

(a) To promote and assist in the promotion of legislation, regulations and codes for the purpose of formulating and improving standards of..... lamps and associated lighting and its applications. The main channels to be nationally through BSI and internationally IEC, ISO and CENEL.*

(b) To prepare appropriate data for ..... lamps for which no BSI specification exists or is immediately contemplated but for which there is need for interchangeability especially as regards ratings, dimensions and electrical characteristics.

(c) To deal specifically with ..... lamp matters arising in BSI Committee ..... in connection with BS ..... and allied specifications.

(d) To advise the Council of Management and the Technical Directors' Committee generally on technical matters.

(e) To deal with all other matters relating to.....lamps referred to it for attention either by the Council of Management or the Technical Directors' Committee.

2. **Composition**

(a) The Committee shall consist of a representative from each of the companies manufacturing ..... lamps.

(b) When necessity dictates the Committee shall include a ..... lamp engineer from each of the companies manufacturing ..... lamps and the Chairman of the Commercial Committee.

(c) Only in exceptional circumstances will substitute representatives be permitted.

3. **Responsibility**

(a) The Committee shall be directly responsible to the Council of Management for all technical matters relating to ..... lamps and for the activities of all related technical sub-committees and panels.

(b) A report on the activities of BSI Committee ..... for each 12 months ending 30th June shall be submitted to the ELIC office by the Chairman of the ..... Committee for the year in question.

4. **Powers and Delegation of Powers**

(a) The Committee may establish Sub-Committees and Panels to deal with specific matters arising; such Panels to be established as far as possible on an ad hoc basis.

(b) The Committee shall delegate such of its powers to the Sub-Committees or Panels as it thinks fit.

(c) The Committee shall appoint a Chairman from the Standards Engineers on a rota basis for a period of twelve months i.e. July to June. He will attend Council of Management and Technical Directors' meetings on request.

(d) Meetings shall be held only when necessary, full opportunity being taken to obtain settlement by correspondence whenever possible.

(e) The Committee shall cause minutes of its proceedings to be recorded copies of which will be circulated to members, Council of Management and the Technical Directors' Committee. Unless notified to the contrary such minutes shall be operative seven working days after the date of issue.

(f) The Committee shall have power to nominate ELIC representation on industry Committees and Sub-Committees.

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* IEC = International Electrotechnical Commission; ISO = International Organisation for Standardisation; CENEL = Comite European de Co-ordination des Normes Electriques.

(g) The Committee shall have power to co-opt members of Working Groups of IEC Technical Committee 34 to attend its meetings when required.

(h) The Committee shall cause reports to be submitted to the ELIC office on the activities of all related BSI Committees and Sub-Committees, where ELIC has representation, for each twelve months ending 30th June. Such reports shall be provided by the appointed Convenor.

(i) The Committee shall provide a channel for keeping the British Lighting Council and Electric Light Fittings Association up to date on ..... lamp technical data.

(j) The Committee to impress on ELIC representatives at BSI the need for expressing a unified industry view but in the event of this proving difficult any matter of importance to be referred to the Council of Management.

5. **Representation at Meetings with Other Bodies**

Whilst Members will as heretofore continue their own liaison with such bodies as:

Admiralty
GPO
National Coal Board
Ministry of Aviation
RAE, Farnborough
Trinity House, etc.

an ELIC Technical Committee shall meet such bodies when requested in which event the most suitable representatives will be nominated in the light of matters under discussion whether members of the ..... Lamp Committee or not.

It is desirable that there be prior discussion before attendance at meetings with other bodies so that ELIC may give an industry view. The outcome of the meetings will be recorded in the ..... Lamp Committee Minutes

APPENDIX 6

(Referred to in paragraph 5)

A General Account of the Manufacture of the Descriptions of Electric Lamps Covered by the Reference

1. Reference lamps fall into three main categories, namely:

(i) General Lighting Service (GLS) lamps, being incandescent tungsten filament lamps used for general illumination.

(ii) fluorescent lamps or tubes used for general illumination, in which light is produced by the excitation of a fluorescent powder.

(iii) discharge lamps, mercury or sodium, in which the light is produced directly from an arc in vapour (although some mercury lamps supplement this by using bulbs coated with fluorescent powder) and which are used primarily for streetlighting, but also to some extent for industrial purposes.

Within each category is a multiplicity of types designed and manufactured for special applications, each of which requires special techniques.

GLS lamp manufacture

2. The most critical component of any incandescent lamp is the tungsten filament. If the lamp is to achieve good efficiency in the conversion of electrical energy into light and to go on doing this for a long life, then the filament must be designed and made to extremely close limits.

The raw material in the form of finely drawn tungsten wire, which for some lamps is only a few microns in diameter (1 micron = 1 thousandth of a millimetre), is very accurately coiled round a molybdenum mandrel wire. For the 'coiled-coil' type, the wound spiral is then coiled around another, larger mandrel. After annealing to 'set' the coiling, the wound spiral is cut into the required lengths and the mandrels dissolved out, using a mixture of nitric and sulphuric acids. Then the coils are visually examined for uniformity of coiling but before assembly in a lamp they must be thoroughly cleaned by being raised to a higher temperature in an atmosphere of hydrogen or hydrogen/nitrogen.

A typical high speed production line will start with a stem machine. This will have automatic feed mechanisms for the flange or flare, the exhaust tube and the two or more special lead wires. The flange or flare will have been prepared from a short length of lead glass tubing, by flaring out one end to approximately twice the tubing diameter. The exhaust tube is a rather longer length of smaller diameter tubing and this may also serve as the support rod inside the lamp. The lead wires normally consist of 4 parts, butt-welded together. Nickel is used to support the ends of the filament, and to this is welded a short length of copper-clad nickel iron or steel which has a co-efficient of expansion very similar to that of glass, and is used to form the gas-tight joint in the pinch. To this is welded a thin monel wire which, after sleeving with glass, forms a protective fuse, and finally a sufficient length of copper wire to pass through the lamp cap for connection purposes.

3. After feeding into the machine heads, in which the components are held in correct relative positions, a turret rotation takes them round through gas fires of progressively increasing intensity melting the glasses and sealing the wires into a pinch, formed by two plates brought together mechanically and pressing the glass into the required shape. Heated air is then blown down the exhaust tube with sufficient pressure to force a 'blow hole' in the soft glass. It is through this hole that the lamp will be exhausted and filled at a later stage.

4. The second machine, known as a mounting mill, finishes the stem ready for sealing in. First the lead wires are flattened at the ends and bent up to form hooks. The filaments are mechanically offered up to the hooks, which are then closed over, clamping the filament securely into position. Extreme accuracy of placing the filament is essential. If it is 'overpinched', i.e. if the effective length between the lead wires is reduced, the filament will be over-run and the life shortened. The end of the glass support rod is then formed into a 'button' with a number of short lengths of molybdenum wire moulded in to provide intermediate filament supports. The free ends of these support wires are then curled round the filament. Finally, some finely divided red

phosphorus is deposited on the filament, so that when the lamp is lit for the first time this will combine with, and render harmless, any traces of oxygen residual in the lamp. The complete stem is then transferred to the sealing machine.

5. At about this stage the glass envelopes or bulbs are fed into the line. They are thoroughly washed internally with hot water and then dried over hot air blowers. The manufacturers trade mark and the voltage, wattage etc, are stamped on the crown and they are fed automatically into the sealing machine, each bulb being carefully positioned so as to surround a stem—also automatically loaded—without damaging the filament or supports. The sealing machine operates in a similar manner to the stem machine, the components held in heads being carried round on a turret and subjected to gas fires of increasing intensity. This heating increases until the glass softens round this band, when the weight of the outlet (the portion of bulb neck below this level) starts to stretch the glass, pulling it inwards onto the flared part of the stem. At this stage really intense fires weld the two glasses together and cut off altogether the cullet. Modern machines then mould the seal to a regular shape by mechanical means.

6. After passing through some softer annealing fires, the sealed bulb is transferred to the exhaust machine. In this machine the work holding head comprises a rubber bush with a bore slightly larger than the external diameter of the exhaust tube to allow easy entry, and mechanical means of applying axial pressure producing radial compression of the rubber round the exhaust tube, thereby ensuring a vacuum tight joint. As the lamp is carried in the head round the exhaust machine, it is automatically connected first to a vacuum system then, alternately, to inert gas flushing and further vacuum systems. The lamp is finally filled to the correct pressure with purified argon/nitrogen mixture and by means of gas and oxygen fires the exhaust tube is sealed off.

7. The fifth machine in a conventional line is the capping and testing machine. Here the lamps have the brass caps, previously prepared with a ring of a synthetic resin cement, threaded over the two lead-out wires and are placed in the machine which maintains pressure on the two components while gas fires cure and harden the cement. While the cement is curing, the protruding lead wires are cut off, leaving just sufficient to be securely soldered to brass contact plates. At this stage the lamps are 'flashed' at a critical voltage to 'set' the filaments, and are run for several stations on the machine. During this time the lamps are checked for complete insulation of the cap, and for correct current rating. Lamps which do not comply are automatically ejected. Good lamps on discharge from this machine pass along to the packing machine for individual packing and are finally packed in labelled outer cartons. Samples are taken regularly from the packing stage for checks to BSI specifications including photometry and life test. Further tests are made on samples, taken twenty-four hours after manufacture, and in the event of a batch not fully complying, this is unpacked and thoroughly re-inspected before despatch.

Fluorescent lamp manufacture

8. The fluorescent (discharge) lamp operates on an entirely different principle from that of the filament lamp, where light is produced by a tungsten wire being heated to incandescence. Light from the fluorescent lamp is emitted from a uniform coating on the inside of the glass bulb of a specially prepared powder, known as 'phosphor'. This is excited by exposure to the 2537 Å radiation (ultra violet) produced by an electric discharge passing through low pressure mercury vapour. The phosphor converts much of the ultra violet into visible light, the precise colour depending on the composition of the phosphor. Hence the phosphor assumes the place of the filament and becomes the most critical material in the manufacture of fluorescent lamps.

9. The basic raw materials have to be purified to a high degree. After mixing in precise proportions with the addition of metallic activators the next process is one of heat treatment under carefully controlled conditions for several hours. The result is a solid cake of material which is checked for fluorescence by viewing under ultra violet light. This is then crushed into powder of a reasonably uniform particle size. The final process is a chemical washing and drying which removes the very small and less efficient particles. To get the maximum performance from the phosphor it must be coated evenly over the whole of the inside surface of the bulb. This is best done by dispersing the phosphor in a nitro-cellulose/butyl acetate lacquer and flushing this down through the bulb under accurately controlled conditions of temperature and humidity. Large air-conditioning plants are required for this purpose. Fluorescent phosphor is a most

sensitive material, and must be treated very carefully and protected from contamination throughout the lamp making process; for this reason, the glass bulbs are washed with demineralised water and dried before the phosphor coating is applied. When the coating is set and dried, the bulb is stamped at one end with the makers trade mark, and the wattage, colour etc., and passed down a conveyor into a baking oven. Here it is carried on rotating rollers under a hearth heated by gas burners and raised to about 450° C. At this temperature the nitro-cellulose is burnt in a stream of pre-heated air which is blown through the bulb.

10. The bulb is now ready for the stems to be sealed into. These stems, though basically similar to GLS lamp stems, differ in detail and in a modern factory will be made on very different machinery. One long machine is used to heat and melt the glass components together and to form the pinch round the lead wire and make the blow hole. While still located on the same chain, the ends of the lead wires are then worked by stages to form the hooks to support the cathode. The foundation of the cathode is a coiled-coil tungsten filament which is then automatically presented to and secured in the lead wire hooks. A fluorescent lamp depends for its operation on good electronic emission from the cathodes and this is provided for by applying a coating of a mixture of the carbonates of barium, strontium and calcium in a nitro-cellulose suspension to the tungsten filament. The complete stems are then released from the machine heads and loaded into trays ready for use on the sealing machines.

11. The process of sealing the two stems into the coated tube is in some degree similar to the sealing-in of incandescent lamps. The principal difference is that instead of dropping a short length of bulb to waste, the end of the bulb is, prior to sealing, moulded inwards a little so that it rests on a rather larger flare, and the two parts are melted together without waste. Most often each end is sealed in turn but machines are now coming into service which seal both ends simultaneously. The sealed lamps are then loaded automatically into the exhaust machine, vacuum tight joints being made as for GLS lamps. The exhaust cycle is however rather different as it is necessary to employ a harder pumping technique, and although some flushing is done it is at a much lower pressure. During pumping the lamp is raised to about 250° C to help release unwanted gases from the bulb. While the pumping and flushing process is going on, currents are passed through the cathode to break down the carbonates into oxides and release CO_2 to be pumped away. A very small amount of mercury is then dosed into the lamp, and when cathode activation and pumping has reached a satisfactory stage, a few millimetres pressure of high purity argon is introduced and the exhaust tube immediately sealed off. Next the lamps are transferred to the capping machine, where the metal and caps already pasted are threaded over the lead wires and held in position on the lamps while the paste is cured. The surplus wire is then removed and the cap pins soldered. Fluorescent lamps are normally given a water repellent layer of silicone material to assist starting under conditions of high humidity on certain circuits. This is done by taking the lamps on a conveyor and rolling them through a shallow tray containing a solution of silicone material in isopropyl alcohol.

12. Before a fluorescent lamp can be started readily on normal voltage supplies, it must be 'aged'. This is done by loading it into a conveyor which applies, through suitable chokes, sufficient current to further activate the cathodes, and then run the lamp at a small overload for some minutes. Whilst still on the ageing conveyor, the lamp is submitted to a number of tests, and is automatically rejected if it fails to pass any one of these. All lamps passing satisfactorily are taken on a conveyor to the packing area, where they are sleeved and boxed. Samples are taken regularly and tested for compliance with BSI and International specifications, particular attention being paid to photometry, colorimetry and life test. After the production has stood in store for twenty-four hours, samples are again selected and inspected for any defects which may have developed during that time. Rather smaller samples are taken, where possible, after three weeks storing as a further check that set standards are being maintained.

High pressure mercury vapour lamp manufacture

13. The manufacture of these lamps can best be described as in two stages:

1. the production of the light source—the arc tube,
2. the assembly of the arc tube into the outer bulb.

As regards the first stage, arc tubes are designed to run at high pressures of mercury vapour (10 to 15 atmospheres) in order to achieve high efficiency conversion of electrical energy into visible light. Conditions which provide these high pressures also produce

high temperatures and therefore, quartz, which has a melting temperature of approximately 2,000° C is used for the body. Quartz, however, is a very low expansion type of material, and since the leads to the electrodes within the lamp must be hermetically sealed to the quartz, a special sealing method is used. This method consists of producing a very thin piece of high melting temperature metal, such as molybdenum or tungsten (0·001″ approximately) which can be sandwiched within the quartz seal. Furthermore, the cross sectional form of this metal must conform to a definite critical shape. Various techniques are used to produce such metal. A simple understanding of a discharge, as produced in these lamps, would be to visualise a stream of electrons shooting from one end of the tube to the other and back again, and during this passage colliding with atoms of mercury which give off energy, mainly in the form of light, together with some energy in the ultra violet region. The arc tube, therefore, must be provided with a source of electrons at each end. These are usually in the form of tungsten coils impregnated with emissive materials, such as barium, thorium etc; such devices are called cathodes or electrodes. In order to ensure the lamp will start up reliably, additional electrodes are added—these are called 'striking electrodes'.

The sequence of manufacture of arc tubes is:

(a) produce quartz shapes or bodies,
(b) provide accurately shaped foil,
(c) make up electrodes and impregnate with emitter,
(d) connect together foil electrodes and lead wires,
(e) seal together these components.

The last operation (e) involves using fires of great heat intensity which provide melting temperatures well in excess of 2,000° C. Having completed the fabrication so far, the arc tube must have every trace of air and occluded gases removed from the interior and then be filled with a controlled low pressure of inert gas, such as Argon. An accurate dose of mercury must be inserted and the tube then sealed.

14. As regards the second stage, the arc tube has now to be fitted into a mounting cradle which must provide an electrical circuit as well as protect the tube from shock and vibration. Wire or sheet metal frames are suitably fabricated and the arc tube attached, either by resistance welding or pressing techniques. A stem is attached which will enable the mounted arc tube to be sealed with an outer bulb. High pressure mercury vapour lamps are used in a variety of lighting applications and, therefore, different bulb shapes are required. Some bulbs are in clear glass but the majority are coated with fluorescent powder so as to improve the colour of the light. In some cases additional reflecting and, or diffusing powders are applied to the bulb. The fluorescent powder, which is activated by the ultra violet energy, generated by the arc tube, is normally applied in a suspension of nitrocellulose together with various solvents. After the coating has dried onto the inner surface of the bulb, the nitrocellulose must be removed and this is achieved by baking out at temperatures around 500° C. The mounted arc tube is then sealed within the bulb, and following this operation the air must be pumped out and be replaced with inert gas filling. Caps of various designs can be attached to the lamps, either by mechanical means or by using cements. The lead wires are then soldered to the cap. At this stage all lamps are lit up on special racks and their electrical characteristics checked for compliance with specification. The lamps are stood for a minimum of twelve hours and checked that they will start up at reduced mains voltages, after which they are packed in specially designed cartons. During the various stages of manufacture it is necessary to apply quality control checking at the most important processes.

Sodium lamp manufacture

15. The manufacture of these lamps can best be described as in three stages:

1. production of the arc tube or light source,
2. assembly of the arc tube into the outer bulb,
3. special treatment given to the outer bulbs.

As regards the first stage, because sodium in vapour form is very active chemically, special resistant glass must be used for the arc tube. In fact, the tubing used is a ply-glass in which the interior glass is resistant to attack and the case glass non-resistant but mechanically strong.

Arc tubes are made in two basic shapes:

(a) hair pin shape, which means the tube must be heated in mid length and then bent to give two parallel legs. After this an exhaust tube is sealed to the apex of the bend,

(b) linear groove shape: the tube remains in linear or straight form but is deformed by heating and moulding to give either crescent, clover leaf or other cross sectional variations. The exhaust tube is added through the end deal at a later operation.

It is usual after each glass working operation to anneal the glass to remove any internal strains or stresses set up within it. The arc tubes are made covering a wattage range of 40 watts to 200 watts. To achieve this range tubes varying both in diameter and length are used. Cathode assemblies are made using tungsten coils which are attached to lengths of copper coated nickel iron wires. These wires are normally covered with one or two coats of glass. Emissive material, such as barium or strontium etc., is used to impregnate the tungsten coils. The completed cathode assemblies are next sealed into the ends of the arc tubes and the tube is then fully annealed. The arc tubes must then be evacuated of all air and occluded gases. It is at this exhaust operation that the sodium metal is introduced and also some inert gas such as argon, neon, etc. The tube is then sealed off.

16. In the second stage, since sodium discharges convert electrical energy into visible light most efficiently at a critical pressure which can best be controlled by maintaining a particular temperature about 250° C., it is important to protect the arc tube from variations in ambient temperatures and to limit heat losses. The simpler and least efficient lamp designs use an arc tube of hair pin shape, which is fitted into a vacuum flask (commonly known as a Dewar flask). Such flasks are made by sealing one bulb within the other and evacuating the space between. Ceramic caps are used on both the arc tubes and flasks to minimise heat conduction. A wire formed into a fork is attached electrically and mechanically to one cathode lead wire of the arc tube, and serves the dual purpose of supporting the tube within the flask and acting as an aid to lamp starting. More recent developments of hairpin shaped lamps replace the separate flask by attaching the arc tube to a stem and sealing the assembly with a bulb. Normally, additional glass tubes are inter-posed between the arc tube and outer bulb to act as a reflector to the heat radiated by the arc tube. The bulb is then evacuated to a hard vacuum and sealed off. Since some out-gassing of the internal components occurs during life, an active chemical, such as barium, is fired by high frequency heating to cover areas of internal glass surfaces. This type of chemical absorbs such released gases. Original design linear lamps are produced in a similar way except that a stem is attached to both ends of the arc tube before each end is sealed to the outer jacket, and of course two caps are also used.

17. As regards the third stage, the latest design of both hairpin and linear lamps use for heat reflectors a thin metal film such as gold bismuth or tin oxide, deposited on the inside of the outer bulb; these replace the internal glass sleeves. Such materials are applied, either by spraying onto heated glass surfaces, or by evaporation from special heater systems placed within the bulbs for this purpose. It is normal, having completed these lamps, to run them for periods of one hour to stabilise the discharge, after which a twelve hour standing time occurs before the lamps are finally tested to ensure correct electrical specification. The lamps are finally packed in suitable cartons.

(*The Commission acknowledge the assistance of BLI in connection with this appendix*)

APPENDIX 7

(Referred to in paragraph 578)

A Technical Paper on the Economic Life of Incandescent Lamps

Prepared for the Monopolies Commission by
J. W. Strange, PHD, ARCSC, FIES

March, 1967

(Dr. Strange was at the time this paper was prepared Executive Director of Research and Engineering of British Lighting Industries Ltd.)

1. The broad basis for determining the economic life of incandescent lamps was given in Mr. L. J. Davies' report of May, 1950, to the earlier inquiry by the Monopolies and Restrictive Practices Commission. It can be restated in a number of different ways but the essential basis is still the same, that the cost of lighting is made up of two main items, the cost of the lamp and the cost of the power needed to operate the lamp. Other factors such as the cost of replacing a lamp, or the rather imponderable factor of the nuisance of having to make such replacement, can also be considered but obviously these factors vary widely with the conditions of use. Some reference will be made later to the effect of such factors on the calculated economic life but first the simple factors will be considered.

2. The main approach is based upon lamp and power costs only and the calculation necessary to arrive at the minimum cost is restated in Appendix 1, concluding with an equation (10) expressing the economic lamp life (T) in terms of the cost of electricity in pence per unit (C_1) and the cost of the lamp (C_2). In order to use this equation to get actual life figures we need information on how much the user is paying for his lamps and for his power. These amounts have, of course, changed considerably over the years since 1950. The figures given in the first two lines of Table 1, show the average power cost for domestic installations, and the retail price for one lamp only, the 100-watt GLS type. The figures are then adjusted for the relative value of the pound, and used to calculate the total cost of lighting (shown on line 9 in terms of 10^6 lumen hours). Finally on lines 10, 11 and 12 the costs are related to the 1951 values.

3. The figures in the table are a very useful background to this consideration of economic lamp life. They show that during the period from 1951 to 1965 the cost of lighting has decreased, due mainly to the fact that the lamp cost has been reduced over this period. They also make clear that the power cost is by far the major component in the total lighting cost. The data of this table are also shown in Figures 1 and 2.

4. Against this general background we need to use the final equation from Appendix 1 in much more detail to arrive at the true economic life of lamps for the wide range of costs which make up the average picture. This has been done, and the results are tabulated in Table 2, for lamps from 40 watt to 1,000 watt, with different costs and discounts, and for a range of typical power costs.

5. Particular emphasis is laid in Table 2 on the most common cases. The domestic user who buys his lamps without discount but with purchase tax is indicated by underlining the second line in each group of figures. Numbers at the top of the righthand columns indicated the most typical power costs for (1) Industrial 1·43d. (2) Domestic 1·93d. and (3) Commercial 2·2d., taken from the Electricity Council Annual Reports and Accounts for 1965/66. Table 2 shows that based on these assumptions the calculated economic lives are in all cases less than 1,000 hours except for the smaller lamps when the power costs are low.

6. These figures are based on the assumption that no charge is made for any cost of replacement. Clearly if this factor is introduced it can cause a substantial change in this picture. This additional cost can most easily be introduced into the equation (1) in Appendix 1 by considering it as an increase in the actual lamp cost, i.e. by adding cost of replacement to the cost of lamp.

7. A simple way of seeing the effect of these alterations is to plot the ratio of lamp cost in pence per watt to the power cost in pence per unit against the economic life. This has been done in Figure 3. For convenience pence per watt is also given in the 5th column of Table 2. To illustrate this point, if we take a 100-watt lamp which costs the

domestic user 22d. the pence per watt figure is 0·22 and for a power cost of 2d. the ratio of lamp to power cost is 0·11 and the economic life from the graph is 680 hours. If we then assume a replacement cost of 2s. the lamp cost goes from 22d. to 46d. and the economic life then becomes 1400 hours. If, on the other hand, as is not untypical of small households and 'bed-sitters', the power cost is 6½d. per unit, then the economic life of the lamp, leaving aside the nuisance of short life and assuming no replacement costs could be as low as 200 hours. The lighting industry is therefore faced with a very difficult choice. Whatever they choose as the economic life of the lamps will be wrong in various sets of circumstances. At one extreme an industrial high bay installation where the replacement costs are high and power costs are low calls for one answer, and at the other extreme domestic installations where replacement costs are nil and power costs may be high calls for another very different answer.

8. During the last ten years the range of requirments has been reduced because to an increasing extent commercial and industrial premises are changing to discharge lamps. With these lamps, in contrast to incandescent lamps, life and efficiency are not directly related and the predicament does not arise. The history with these light sources has been a steady increase in efficiency as well as a remarkable increase in life. For example, the low pressure fluorescent discharge lamp in the most common U.K. 5-foot size has increased in efficiency from 35 l/w to 70 l/w at the same time as the life has increased from 2,000 to 7,500 hours.

9. With incandescent lamps, however, life and efficiency are directly related and a decision on the optimum economic life to give the lighting required is necessary. In the early days of lamp manufacture at low machine speeds and limited quantities it was possible to make a wide diversity of types and wattages. It was also necessary to do so due to the wide range of supply voltages. With increasing standardisation of supply voltages and also with increasing speeds of equipment and, in consequence, higher volumes of production an increasing degree of standardisation was vital and it has been important in holding lamp costs down over the last fifteen years (e.g. see Figure 1 for the effect of standardisation of bulb size on the 100-watt lamp costs). Short runs involving 'down time' of expensive equipment sharply increase cost and at the same time reduce quality. Cost continues to increase throughout the subsequent operations of warehousing, distribution and marketing.

10. It is for these reasons that over the years a single objective life for any given general service lamp type has been the aim of the manufacturers and users represented on the British Standards committees. This has resulted in the requirements in B.S. 161 for a life of 1,000 hours, and also in the corresponding International Electrotechnical Commission specification, Publication 64. The need for a second subsidiary standard in certain special cases, e.g. the Scandinavian countries, where power costs are low, has been recognised with the publication of 64A for lamps with a life of 2,500 hours.

ANNEX A

Economic GLS Lamp Life

Introduction

The life of a GLS lamp should be based upon the most economic overall cost to the consumer. The following calculation is an attempt to produce a general formula, relating cost of electricity, initial lamp cost and lamp wattage, to the most economic consumer life:

Theory

The important factor to the consumer is how much his illumination costs him, and this can be expressed as cost per hour per lumen = N. This cost can be expressed using the following symbols:

where t = lamp life in hours,
T = economic lamp life in hours,
C_1 = cost of electricity in pence per unit kWH,
C_2 = cost of lamp, or lamp plus handling costs, in pence,
and W = power of the lamp in watts.

Cost of lamp operation per hour

Cost of electricity per hour.

$$\frac{\text{Lamp power}}{1{,}000} \times \text{cost of electricity per unit} = \frac{W C_1}{1{,}000} \tag{1}$$

Cost of lamp per hour amortised over its life.

$$\frac{\text{Initial Cost}}{\text{Lamp Life}} = \frac{C_2}{t} \tag{2}$$

Total Cost of Lamp Operation per hour = (1)+(2)

$$C = \left(\frac{W C_1}{1{,}000} + \frac{C_2}{t}\right) \tag{3}$$

Cost per hour per lumen (lumen hour)—(N)

$$\mathrm{N} = \frac{\text{Total cost per hour}}{\text{Total lumens}} = \frac{\text{Total cost per hour}}{\text{Lamp eff.} \times \text{lamp power}} = \frac{C}{E.W.} \tag{4}$$

Substituting (3) in (4)

$$N = \frac{\frac{W C_1}{1{,}000} + \frac{C_2}{t}}{E.W.} = \left(\frac{C_1}{1{,}000E} + \frac{C_2}{E.W.t}\right) \tag{5}$$

Life period is related to efficiency such that

$$E = \frac{K}{t^{1/7}} \tag{6}$$

K is a constant for any specific wattage and design, and is dependent upon gasfilling, bulb finish, coil design and the intrinsic quality of the product.

Substituting (6) in (5)

$$N = \frac{1}{K}\left[\frac{C_1 t^{1/7}}{1{,}000} + \frac{C_2}{W t^{6/7}}\right] \tag{7}$$

The economic life to give minimum cost per lumen hour—(T)

This will occur when $\frac{dN}{dt} = 0$

$$\frac{dN}{dt} = \frac{1}{K}\left[\frac{C_1 t^{6/7}}{7{,}000} - \frac{6}{7} \cdot \frac{C^2}{W t^{13/7}}\right] = 0 \tag{8}$$

Hence

$$\frac{C_1}{7{,}000 t^{6/7}} = \frac{6}{7} \cdot \frac{C}{W t^{13/7}} \tag{9}$$

Therefore

$$T = \frac{C_2}{C_1} \times \frac{6{,}000}{W} \tag{10}$$

The economic lamp life is directly proportional to the lamp cost and inversely proportional to the cost of electricity.

TABLE 1: **Economic Progress of Lighting with 100 W GLS Lamps**

Date	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1. Average domestic power cost d/kWH	1·37	1·46	1·54	1·53	1·53	1·58	1·67	1·70	1·69	1·61	1·67	1·68	1·77	1·83	1·93
2. 100 W GLS lamp price d	18	21	22	22	22	22	22	22	17	17	17†	17	18·5	18·5	18·5
3. Price with purchase tax	26	26	27	27	27	27	27	27	20	20	20	21	21	22	22
4. Value of £ relative to 1951	1·0	0·95	0·95	0·90	0·88	0·83	0·81	0·78	0·78	0·78	0·78	0·76	0·71	0·71	0·69
5. Power cost kWH relative to 1951 d	1·37	1·39	1·46	1·38	1·35	1·31	1·35	1·33	1·32	1·26	1·30	1·28	1·26	1·30	1·33
6. GLS lamp price + P.T. rel. to 1951 d	26	25	26	24·5	24	22·5	22	21	16	16	16	16	15	15·5	15
7. Total cost of lighting $1{\cdot}16\times10^6$ LH/1951 d*	163	164	172	163	159	154	157	154	148	142					
8. Total cost of lighting $1{\cdot}26\times10^6$ LH/1951 d											146†	144	141	145	148
9. Total cost of lighting 10^6 LH/1951 d	140	141	148	140	137	133	135	133	128	123	116	114	112	115	117
10. % Power cost relative to 1951	100	102	106	101	99	96	99	97	96	92	95	93	92	95	97
11. % GLS lamp price + P.T. rel. to 1951	100	96	100	94	92	87	84	81	62	62	62	62	58	60	58
12. Cost 10^6 LH relative to 1951	100	101	106	100	98	95	96	95	91	88	83	82	80	82	84

* e.g. A 100-watt lamp produces 1,160 lumens or $1{\cdot}16\times10^6$ lumen hours (LH) in 1,000 hrs. at a cost of $1{\cdot}37\times1\times10^3$ pence for power and 26 pence for the lamp, totalling 163d.

† Introduction of coiled-coil lamp as standard but with 1,260 instead of 1,160 lumens.

TABLE 2: **Calculated Economic Objective Lamp Lives**

Lamp type and list price (Pence)	User discount (%)	Price (*Pence*)	Purchase tax (*Pence*)	Buying price (*Pence*)	Buying pence/ Watt	Economic life hours for power cost in pence/unit 1·0	(1) 1·43	1·5	(2) 1·93	(3) 2·2	4·0	6·5
40 W GLS	Nil	18·5	Nil	18·5	0·46	2700	1900	1800	1400	1200	690	440
L.P. 18·5	Nil	18·5	3·5	22·0	0·55	3300	2300	2200	1700	1500	830	520
	20·0	14·8	3·5	18·3	0·46	2700	1900	1800	1400	1200	690	440
	27·5	13·4	3·5	16·9	0·42	2400	1700	1600	1250	1100	600	380
	37·5	11·5	3·5	15·0	0·38	2200	1530	1500	1100	980	560	350
	42·5	10·6	3·5	14·1	0·35	2100	1450	1400	1050	920	520	330
60 W GLS	Nil	18·5	Nil	18·5	0·31	1900	1300	1200	940	820	480	290
L.P. 18·5	Nil	18·5	3·5	22·0	0·37	2150	1500	1450	1100	980	550	350
	20.0	14·8	3·5	18·3	0·31	1900	1300	1200	820	940	480	290
	27·5	13·4	3·5	16·9	0·28	1700	1150	1100	850	740	420	260
	37·5	11·5	3·5	15·0	0·25	1500	1050	1000	760	680	380	240
	42·5	10·6	3·5	14·1	0·23	1500	960	930	710	620	350	220
100 W GLS	Nil	18·5	Nil	18·5	0·185	1100	760	750	560	480	280	180
L.P. 18·5	Nil	18·5	3·5	22·0	0·22	1350	920	880	670	580	340	220
	20·0	14·8	3·5	18·3	0·185	1100	760	750	560	480	280	180
	27·5	13·4	3·5	16·9	0·17	1000	700	680	510	450	260	160
	37·5	11·5	3·5	15·0	0·15	900	620	600	460	400	230	145
	42·5	10·6	3·5	14·1	0·14	830	580	550	420	370	210	135
150 W GLS	Nil	24·0	Nil	24·0	0·16	960	660	640	480	420	240	150
L.P. 24	Nil	24·0	4·5	28·5	0·19	1100	780	750	580	500	280	180
	20·0	19·2	4·5	23·7	0·16	960	660	640	480	420	240	150
	27·5	17·4	4·5	21·9	0·145	900	600	600	450	380	230	145
	37·5	15·0	4·5	19·5	0·13	770	520	510	380	340	200	120
	42·5	13·8	4·5	18·3	0·12	720	490	480	360	300	180	115

Underlined is the calculation for the typical domestic user's product. The line above is the same without Purchase Tax.
Note: Average Power Cost for 1965/6 (1) Industrial (2) Domestic (3) Commercial, from The Electricity Council Annual Reports and Accounts. *contd.*

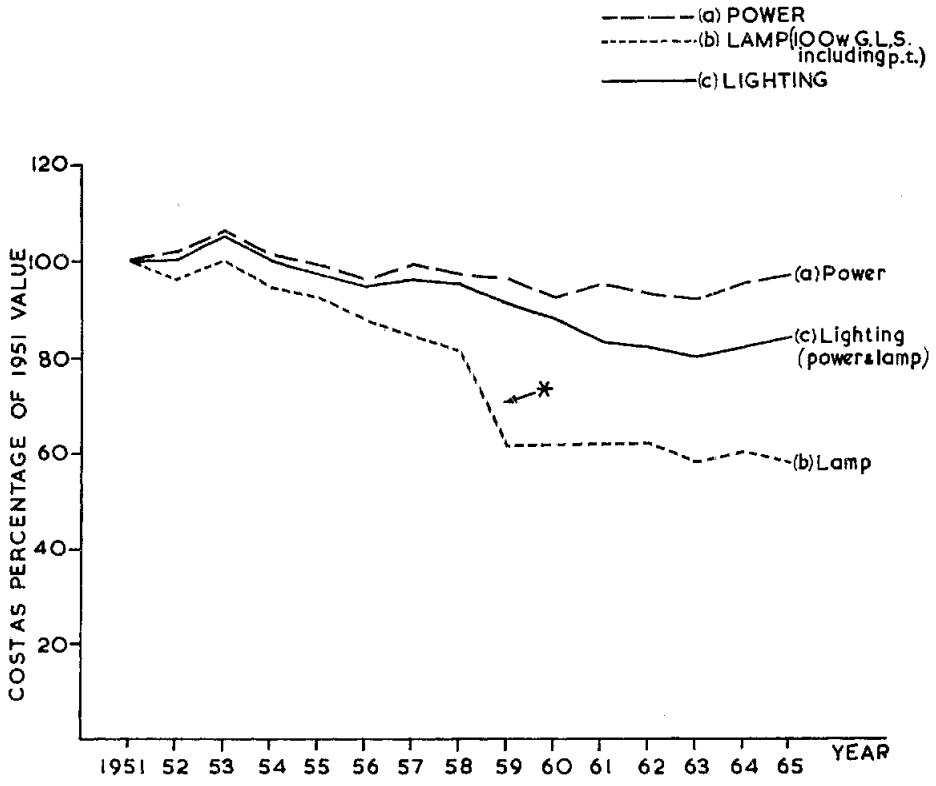
TABLE 2: **Calculated Economic Objective Lamp Lives**—*continued*

Lamp type and list price (Pence)	User discount (%)	Price (*Pence*)	Purchase tax (*Pence*)	Buying price (*Pence*)	Buying pence/ Watt	Economic life hours for power cost in pence/unit (1) 1·0	(1) 1·43	1·5	(2) 1·93	(3) 2·2	4·0	6·5
200 W GLS	Nil	33	Nil	33	0·165	960	680	640	490	430	240	150
L.P. 33	Nil	33	6·5	39·5	0·20	1200	830	800	600	540	300	190
	20	26·5	6·5	33	0·165	960	680	640	490	430	240	150
	27·5	24	6·5	30·5	0·15	900	620	600	460	400	230	145
	37·5	20·5	6·5	27	0·14	830	580	550	420	370	210	135
	42·5	19	6·5	25·5	0·13	770	520	510	380	340	200	120
300 W GLS	Nil	87	Nil	87	0·29	1750	1200	1150	880	780	450	270
L.P. 87	20	70	Nil	70	0·23	1400	960	930	700	620	350	220
	27·5	63	Nil	63	0·21	1300	870	830	640	560	320	200
	37·5	54	Nil	54	0·18	1100	730	750	540	470	280	180
	42·5	50	Nil	50	0·17	1000	700	680	510	450	260	160
500 W GLS	Nil	120	Nil	120	0·24	1450	1000	970	740	650	370	230
L.P. 120	20	96	Nil	96	0·19	1100	780	750	580	500	280	180
	27·5	87	Nil	87	0·17	1000	700	680	510	450	260	160
	37·5	75	Nil	75	0·15	900	620	600	460	400	230	145
	42·5	69	Nil	69	0·14	830	580	550	420	370	210	135
1000 W GLS	Nil	204	Nil	204	0·20	1200	830	800	600	540	300	190
L.P. 204	20	163	Nil	163	0·16	960	660	640	480	420	240	150
	27·5	148	Nil	148	0·15	900	620	600	460	400	230	145
	37·5	128	Nil	128	0·13	770	520	510	380	340	200	120
	42·5	117	Nil	117	0·12	720	500	480	360	320	180	115

Underlined is the calculation for the typical domestic user's product. The line above is the same without Purchase Tax.
Note: Average Power Cost for 1965/6 (1) Industrial (2) Domestic (3) Commercial, from The Electricity Council Annual Reports and Accounts.

FIG. 1

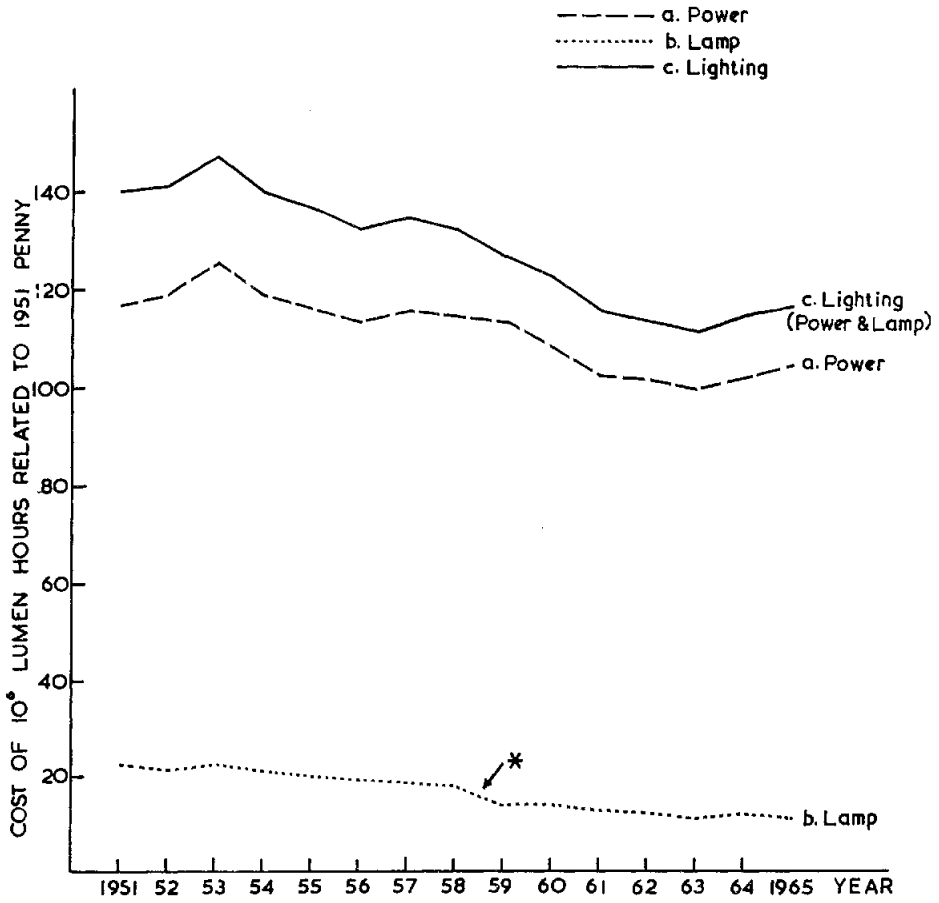
RELATIVE ECONOMIC PROGRESS OF 100W G.L.S. INCANDESCENT LAMP LIGHTING



* Cost reduction due to standardisation of small bulb size

FIG. 2.

COST OF 100W. GLS. LIGHTING
RELATIVE TO 1951



* Cost reduction due to standardisation of small bulb size

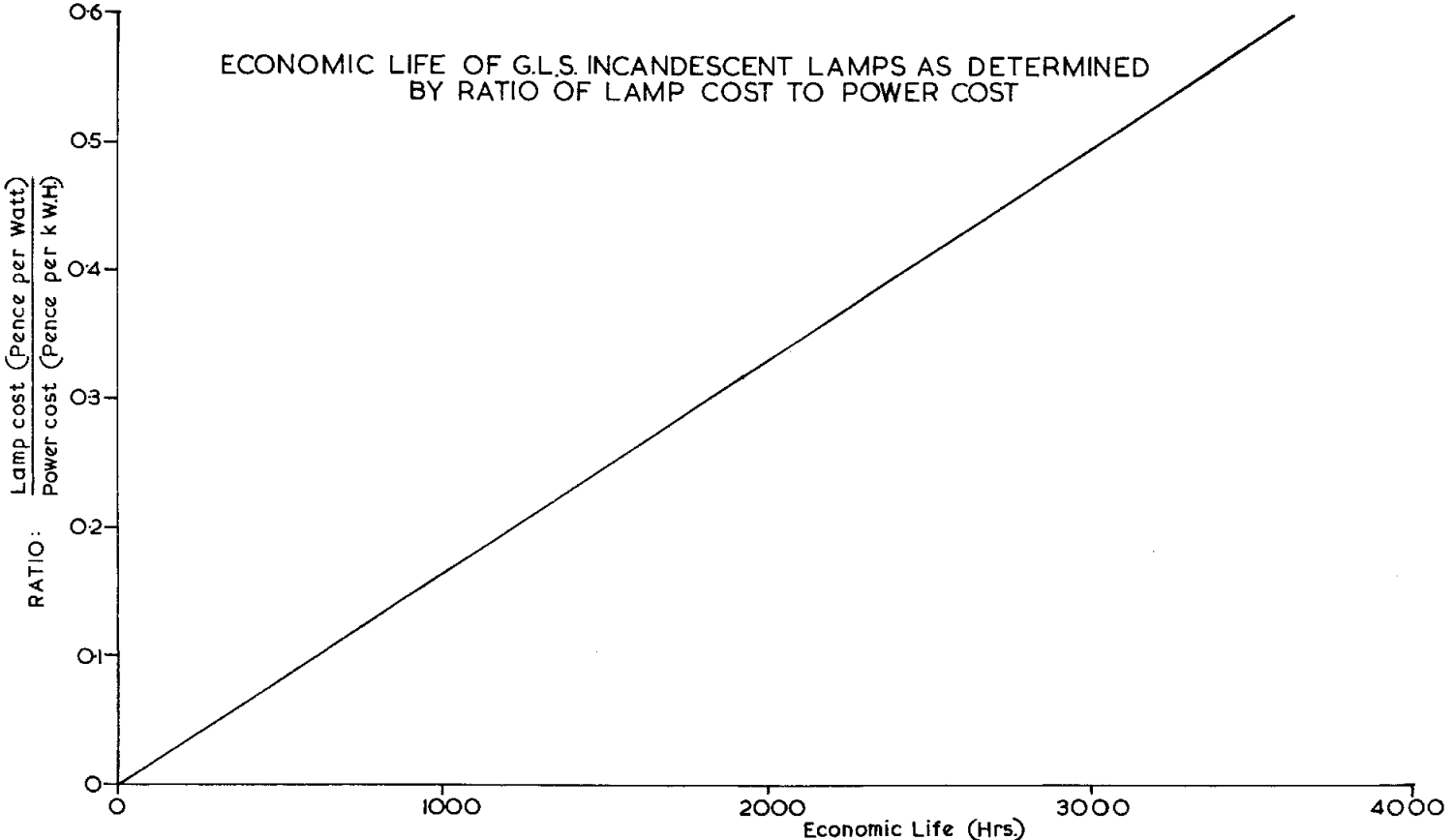

ECONOMIC LIFE OF G.L.S. INCANDESCENT LAMPS AS DETERMINED BY RATIO OF LAMP COST TO POWER COST
RATIO: Lamp cost (Pence per Watt) / Power cost (Pence per k.W.H)
0·6
0·5
0·4
0·3
0·2
0·1
0
0
1000
2000
3000
4000
Economic Life (Hrs.)

FIG.3

ANNEX B

Scandinavia Market and IEC Publication 64A

It may be of interest to supplement the reference on page 5 to Publication 64A and 2,500-hour lamps with some of the power and lamp costs that have supported this extention of the original specifications in the main country concerned, Norway.

Lamp costs. The following are the latest available consumer prices without any rebates

Wattage	40 W	60 W	100 W	150 W
Kroner	1·55	1·90	2·60	4·15
Pence	19	23	31·5	50
Pence per watt	0·47	0·38	0·315	0·33

Power costs. The following are the rates authorised by Oslo Municipal Council on 19.12.63 and are typical of Norwegian rates. The rates are used in conjunction with Fig. 3 to find the lamp/power ratio of costs and the economic life for the 100 W lamp.

		Rate (*in pence*)	Ratio	100 W life
F.1 Commercial lighting	(10 kw)	2·5	0·13	800
F.2 Commercial lighting	(Flat rate)	3·4	0·09	480
F.3 Commercial lighting	(Limited load)	2·1	0·15	900
H.2 Domestic	(Excess load)	1·6	0·20	1200
H.2.O Domestic	(Flat rate)	0·96	0·30	1800
H.3 Domestic	(Two part)	0·73	0·43	2600
H.4 Domestic	(Limited two part)	0·69	0·46	2800

In cases where the power costs are less than 1d./unit there is a clear case for lamps with lives of 2,500 hours as covered by Publication 64A. For the rest of the market where power costs vary from 1·6 to 3·4d./unit the case for the 1,000-hour lamp is still clear. The only exception arises when replacement costs are high and must be added to give the effective lamp costs.

Appendix 8

TABLE 1

Recommended or Published Retail List Prices[1] of Some Popular Types of Reference Lamps

(i) Filament lamps

Supplier	Brand	GLS coiled-coil 60- and 100-watt		GLS single-coil 60-watt		GLS single-coil 100-watt		150-watt		Mushroom 60-watt		Mushroom 100-watt	
		List price	*Retail price inc. p. tax*	*List price*	*Retail price inc. p. tax*	*List price*	*Retail price inc. p. tax*	*List price*	*Retail price inc. p. tax*	*List price*	*Retail price inc. p. tax*	*List price*	*Retail price inc. p. tax*
		s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
BLI	Mazda	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
	Atlas	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
	Ekco	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
	Nura	—	—	1 2	1 5½	1 5	1 8½	1 9½	2 2	1 6¼	1 10	1 9½	2 2
Philips	Philips	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4	2 1½	2 7
	Stella	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4	2 1½	2 7
Luxram	Luxram	1 7½	1 11	1 6½	1 9½	1 6½	1 9½	2 0	2 5	1 11	2 3	2 1½	2 6
	Star	—	—	1 2	1 4½	1 4½	1 7½	1 8	1 11½	1 6¼	1 9½	1 8	1 11½
Kingston	Kingston	1 6½	1 10½	1 6½	1 10½	1 6½	1 10½	2 0	2 5½	1 11	2 4½	2 1½	2 7½
	Insular	—	—	1 6½	1 10½	1 6½	1 10½	2 0	2 5	1 11	2 4	2 1½	2 7
	United	—	—	1 2	1 4½	1 5½	1 9	1 9½	2 1½	1 6½	1 10	1 9½	2 1½
Osram	Osram	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
	Elasta	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
	Ascot	1 7½	1 11½	1 6½	1 10½	1 6½	1 10½	2 0	2 5	1 11½	2 4½	2 2	2 7½
Cryselco	Cryselco	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
Crompton	Crompton	1 7½	2 0	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 9½	2 2½	1 10	2 3
	Hygrade [2]	—	—	—	1 5½	—	1 8½	—	2 0½	—	1 9	—	2 0
Controlled Companies	Britannia	—	—	1 6½	1 9½	1 6½	1 9½	2 0	2 4	1 10	2 1½	2 0	2 4
	Ismay	—	—	1 6½	1 10½	1 6½	1 10½	2 0	2 5½	1 10	2 3	2 0	2 5½
	Splendor	—	—	1 6½	1 10½	1 6½	1 10½	2 0	2 5½	1 10	2 3	2 0	2 5½
British Luma	U C	1 6½	1 11	1 6½	1 11	1 6½	1 11	2 0	2 5½	1 11	2 4½	2 1½	2 7
Maxim	Maxim	—	—	1 6½	1 10	1 6½	1 10	2 0	2 4½	1 11	2 3½	2 1½	2 6½
Multiple retailer	*Brand*												
Woolworth	Sunshine, Vesta	—	—	—	1 5	—	1 9	—	2 2	—	1 10	—	2 2

Notes: (1) Where the list price plus purchase tax results in a farthing or three-farthings the retail price has been rounded up to one-halfpenny or one penny respectively.

(2) Crompton has no list prices for Hygrade lamps; the lamps are generally retailed at the prices shown.

Appendix 8

TABLE 1 *continued*

(ii) Fluorescent Lamps (standard colours)

Supplier	Brand	4 ft. 40 watt				5 ft. 65/80 watt			
		List price		*Retail price including p. tax*		*List price*		*Retail price including p. tax*	
		s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
BLI	Mazda	9	9	12	0	10	6	12	11
	Atlas	9	9	12	0	10	6	12	11
	Ekco	9	9	12	0	10	6	12	11
Philips	Philips	9	9	12	0	10	6	12	11
	Stella	9	9	12	0	10	6	12	11
Osram	Osram	9	9	12	0	10	6	12	11
	Elasta	9	9	12	0	10	6	12	11
	Ascot	9	9	11	10	10	6	12	8½
Crompton	Crompton	9	9	12	0	10	6	12	11
Cryselco	Cryselco	9	9	12	0	10	6	12	11
British Luma	U C	9	9	12	0	10	6	12	11
Endura (1)	Endura	—		7	1½	—		7	11
Longlamps	Longlamps	9	9	11	11½	10	6	12	11
Lymelite	Lymelite	9	9	12	0	10	6	12	11
Maxim	Maxim	9	9	11	7	10	6	12	5

Note: (1) Endura supplies lamps to retailers at net prices and believes that the retail prices would be approximately as shown.

Appendix 8

TABLE 1 *continued*

(iii) Mercury and Sodium Discharge Lamps

These lamps are not liable to purchase tax (see paragraph 19) and the prices are the suppliers' recommended or published list prices. The lamps are not normally sold by retailers.

Supplier	Brand	Mercury (MBF/U) lamps			Sodium linear (SLI/H) lamp		Sodium integral (SOX) lamp		Sodium integral (SOI/H) lamp	
		80-watt	*125-watt*	*400-watt*	*60-watt*	*140-watt*	*55/60-watt*	*90/100-watt*	*60-watt*	*140-watt*
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
BLI	Mazda									
	Atlas	2 5 0	2 13 0	6 10 0	3 17 6	5 15 6				
	Ekco									
Philips	Philips	2 5 0	2 13 0	6 10 0			4 5 0	4 17 0		
	Stella									
Osram	Osram	2 5 0	2 13 0	6 10 0						
	Elasta								3 12 6	4 17 6
Crompton	Crompton	2 5 0	2 13 0	6 10 0						

Note: The prices shown for sodium lamps are those recommended or published by the manufacturer of each type. Where the lamps are inter-traded with other manufacturers, the buyer's recommended or published list price is the same as that of the manufacturer of the lamp (see paragraph 199).

Appendix 8

TABLE 2

Index Numbers of Costs and Prices in 1966 (base year 1948 = 100)

	Index numbers 1966	*Movements relative to the retail price index*
Retail price index	194	100
Main-brand lamps—retail prices (excluding purchase tax)		
60-watt filament lamp	123	64
100-watt filament lamp	88	45
80-watt 5 ft. fluorescent lamp	68	35
Wages		
Weekly wage rates—manufacturing industry	224	116
Average weekly earnings	297	153
Materials		
Manufacturing industry—basic materials and fuel	167	86
Copper	418	216
Brass ingots	364	188

Source: Government statistics

Appendix 8

TABLE 3

Sodium and Mercury Discharge Lamps

Examples of net prices to local authorities allowed the highest rates of discount in the years 1951–68 together with lamp performance in terms of light output and life.

	Sodium(1)				**Mercury**(2)			
	Net price(3)	Watts	Light output	Life	Net price(3)	Watts	Light output	Life
	s. *d.*		*Lumens*	*Hours*	*s.* *d.*		*Lumens*	*Hours*
1951	68 1	140	10,640	(Not quoted)	37 5	400	16,800	(Not quoted)
1955	67 1	140	10,250	4,000	36 10	400	16,800	4,000
1962	61 3	140	10,250	4,000	39 1	400	19,000	5,000
1964	55 8	100	12,000	6,000	39 1	400	20,500	5,000
1966	58 5	90	12,250	6,000	45 1	400	20,500	5,000
1968	58 2	90	12,500	6,000	45 7	400	20,500	7,500
Movements	*Reduction*	*Reduction*	*Increase*	*Increase*	*Increase*		*Increase*	*Increase*
1951 to 1968	15%	36%	17%	50% (minimum)	22%	No change	22%	87% (minimum)

Notes: (1) **Sodium lamps.** The figures given for the years 1951–1962 are for the SO/H lamp, and for the years 1964–68 are for the SOX lamp.

(2) **Mercury lamps.** The figures given for the years 1951–55 are for the MA/V lamp, which could be operated only in the vertical position. The figures given for the years 1962/68 are for the MB/U lamp which can be operated either in the vertical or the horizontal position.

(3) **The net prices** have been calculated on the basis of list prices less discounts as follows:

	%		%		%
1951	28·75	1955	37·56	1962	37·5
1964	37·5	1966	12·5	1968	40·0

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TABLE 4

Movements in the List Prices (excluding purchase tax) of Some Popular Types of Main-Brand Lamps, 1956–1967

Filament lamps clear and pearl (watt)	Single-coil price changes						Coiled-coil prices changes							Fluorescent lamps	Price changes		
	1956	1959	1960	1961	1963	1967	1956	1958	1959	1960	1961	1963	1967		1956	1960	1967
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*		*s. d.*	*s. d.*	*s. d.*
25	1 6½	1 4	1 6	1 5	1 6½	—											
40	1 4½	1 2½	—	1 5	1 6½	—	1 9	1 5½	1 3½	1 2½	1 5	1 6½	—	4 ft. 40 watt	11 9	9 9	—
60	1 4½	1 2½	—	1 5	1 6½	—	1 9	1 5½	1 3½	1 2½	1 5	1 6½	—	5 ft. 80 watt	13 0	10 6	—
75	1 10	—	—	—	1 11	—	2 1½	1 11	—	1 10	—	1 11	—				
100	1 10	1 5	—	—	1 6½	—	2 1½	1 11	1 6	1 5	—	1 6½	—				

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TABLE 5

List Prices (excluding all taxes) in the United Kingdom and other countries of a Selection of Popular Types of Filament Lamps in 1951 and 1966, and of Fluorescent Lamps in 1962 and 1967

Country	Volts	*Filament* 40 W		60 W		100 W		*Fluorescent* 4 ft. 40 W		5 ft. 80 W	
		1951	1966	1951	1966	1951	1966	1962	1967	1962	1967
		d.	*d.*	*d.*	*d.*	*d.*	*d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
United Kingdom	200–260	13·0	18·5	13·0	18·5	18·0	18·5	9 9	9 9	10 6	10 6
Belgium	200–260	23·0	16·0	25·5	16·5	41·0	21·5	NA	7 7½	NA	9 10½
Switzerland	200–260	24·0	21·0	28·5	25·0	49·0	39·5	NA	8 4	NA	12 10
France	200–260	22·0	16·0	27·5	18·0	43·0	23·5	7 6½	6 0½	11 7	9 10½
Sweden	200–260	16·5	20·0	20·5	23·0	29·5	28·0	6 11	7 11	12 5	12 5
Norway	200–260	13·5	16·0	18·5	20·0	31·5	27·0	NA	8 0½	NA	11 2
Portugal	200–260	33·5	20·0	40·0	24·0	65·5	32·0	NA	6 3½	NA	9 0
Germany	200–260	22·5	19·5	26·0	19·5	35·0	23·5	10 1	7 5½	14 1	10 3½
Holland	200–260	16·0	17·5	16·0	17·5	20·0	22·0	6 8	6 8	9 9	9 9
USA	100–130	12·0	20·5	12·0	20·5	15·5	20·5	9 2½	9 2½	Not marketed	
Canada	100–130	15·5	20·5	15·5	20·5	22·5	20·5	9 11	9 11		

All prices converted to Sterling at September 1966 rates.

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TABLE 6

Trading Arrangements for Main Brands of Reference Lamps

ELIC 1960 Discount Schedule; BLI's discount structure, April 1967: Philips' discount structure, March 1968

ELIC 1960 Discount Schedule

Classification of customers	Standard discounts allowed by ELIC members individually Jan. 1960–March 1967	
WHOLESALERS Total net annual purchases, all brands, all sources	%	%
Below £20,000	38 & 4½	(40·79)
£20,000–£49,999	38 & 6	(41·72)
£50,000 and over	38 & 6½	(42·03)
Super wholesalers	38 & 6½ & 10	(47·83)
ELECTRICAL RETAILERS AND CONTRACTORS, DEPARTMENTAL STORE GROUPS, MULTIPLES AND MAIL ORDER STORES Total net annual purchases, all brands, all sources	LIST VALUE OF ORDER	%
Under £5,000	Under £15	30
	£15	31·75
	£35 and over	33·5
£5,000 and over	All orders	35
LOCAL AUTHORITIES (BY TYPES AND POPULATIONS)	%	
Class A	20	
,, B	27½	
,, C	37½	
ELECTRICITY BOARDS	LIST VALUE OF ORDER	%
HQ, Area Boards with total net annual purchases below £100,000 and Scottish Boards	Under £50	35
	£50	36·625
	£125 and over	38·25
Area Boards with total net annual purchases of £100,000 and over	Under £50	37·5
	£50	39·06
	£125 and over	40·625

BLI's discount structure, April 1967 (adopted by other ELIC members)

Classification of customers	Basic	Basic + 2½% QD on £75 list value of consignment
WHOLESALERS Total net annual purchases, all brands, all sources	%	%
Below £20,000	41+	42·475+
£20,000–£49,999	42·25+	43·694+
£50,000–£149,999	42·75+	44·181+
£150,000–£249,999	44	45·400
£250,000 and over	45	46·375

+Revised rates introduced August 1967

ELECTRICAL RETAILERS AND CONTRACTORS LIST VALUE OF CONSIGNMENT	%
Under £25	30
£25	33·5
£75	36
£125 and over	37·5
DEPARTMENTAL STORE GROUPS, MULTIPLES AND MAIL ORDER STORES	40
LOCAL AUTHORITIES	40

AREA ELECTRICITY BOARDS Total net annual purchases, all brands, all sources.	
Under £100,000	40
£100,000 and over	42·5

Philips' discount structure, March 1968

Classification of customers		Basic	Basic + QD on list value of: £50	£100	£250	£500
WHOLESALERS Total net annual purchases from:						
(i) all sources	(ii) Philips and Stella (direct)	%	%	%	%	%
Below £50,000	Below £10,000	40	41·2	43	44·2	44·8
£50,000–£149,999	£10,000–£49,999	41·5	42·67	44·425	45·595	46·18
£150,000 and over	£50,000 and over	43	44·14	45·85	46·42	46·99
Super and selected wholesalers		45	—— negotiable ——			

ELECTRICAL RETAILERS AND CONTRACTORS, LARGE STORES, MULTIPLES, LOCAL AUTHORITIES AND NATIONALISED INDUSTRIES, INCLUDING AREA BOARDS LIST VALUE OF CONSIGNMENT	%
Under £50	30
£50	33·5
£100	37
£250	40·5
£500 and over	44

Appendix 8

USERS, GAS BOARDS AND HOSPITALS		USERS, GAS BOARDS AND HOSPITALS	RECOGNISED TRADE USERS	
Total net annual purchases, all brands all sources	%		LIST VALUE OF CONSIGNMENT	%
Users, under £1,000, and non-NHS hospitals	20	Classifications and rates of discount unchanged.	£50*	30
Users and Gas Boards, £1,000–£9,999, and NHS hospitals	27½		£100	35
Users and Gas Boards, £10,000 and over	37½		£250	40
			£500 and over	44
			*Minimum order £50 catalogue value	

Note: Between January 1960 and September 1964 the above standard rates of discount applied to *all types of reference lamps*. From September 1964 the following standard rates were applied to *sodium and mercury discharge* lamps:

	Net trade prices
	%
Wholesalers and certain large users	15
Local authorities and electricity boards	12½
Retailers and contractors (£5,000 and over)	10
Users and gas boards (£10,000 and over)	7½
Other buyers	net

Appendix 8

TABLE 7

Initial Light Outputs required by Different Specifications for GLS, Mushroom and Long Life Filament Lamps

240 volts	1000-hour lamps			Long life lamps	
	Coiled coil BS 161/68	Mushroom BS 555/62	Single coil BS 161/68	2000-hour single coil NCB 241/64	2500-hour single coil IEC 64A/62
Watts	*Lumens*	*Lumens*	*Lumens*	*Lumens*	*Lumens*
40	410	380	340	315	295
60	700	640	610	565	530
100	1330	1220	1230	1140	1070
150	2120*	1860	2060	1905	1790

* This figure was provided by BLI as BS 161/68 does not cover the 150-watt *coiled-coil* lamp.

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HM 2117 Dd. 140370 3336/2/

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