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R.A.F. Institute of Pathology and
Tropical Medicine,
HALTON

4th July, 1958

Sir,

Blood Counts and Radiation Hazards

I have the honour to forward my views on the above subject in response to Air Ministry request under reference C.95567/57/MA5.

2. I have attended several lectures and symposia on the laboratory aspects of radiation hazards and at all these the conclusion has been reached that significant changes in blood counts from exposure to radiation are not signs of impending danger but of gross overdosage already received. The routine use of blood counts is therefore not only futile but is actually dangerous in that it tends to produce a feeling of false security in the uninitiated and to engender slackness in the use of monitoring methods on which reliance should be placed.
3. It is sometimes argued that pre-employment counts should be performed to exclude from employment anyone whose blood picture already shows pathological abnormalities. The validity of this argument in both its professional and administrative or medico-legal aspects is open to question. So far as I am aware there is no evidence that a person with anaemia, leucopenia or any other blood abnormality is any more susceptible to the effects of radiation than the normal subject. From the medico-legal angle a normal pre-employment count merely strengthens a claim that a subsequent abnormality has been caused by radiation. It is true that an already incipient leukaemia might conceivably be picked up by the pre-employment count, but the chances of this happening must be in the region of 1/1,000,000 or even less, so that in practice to do routine counts for this reason alone is equivalent to spending £1 to save a penny.
4. It would be helpful if a report could be obtained from the scientists at Aldermaston stating their views and their reasons for wanting routine blood counts.

[REDACTED]

[REDACTED]

Consultant in Pathology and
Tropical Medicine.

[REDACTED]

[REDACTED]

Blood Counts
Notes for T.F.C. (from [REDACTED])

1. Several must be done in the same individual under standard conditions to establish their "normal" count.
 2. A single low count in an otherwise normal individual would in itself be of little significance.
 3. If it were really significant, in the overwhelming majority of cases he would have been accepted as a sick man already.
 4. In view of this we must consider "the logistics" involved in wholesale blood counts on say 4,000 people [REDACTED] on the island.
 5. I estimate that for a single blood count, a minimum time of 20 minutes must be allowed - this takes no account of cleaning pipettes, slides, preparing diluent fluids, and keeping the microscope properly serviced.
 6. However, assuming a continuous supply of fresh pipettes and slides, to complete one examination on 4,000 people would take a minimum of $\frac{4000}{3}$ hours = 1,333 hours approximately, and assuming an 8 hour working day this figure becomes $\frac{1,333}{8} = 166$ days.
 7. In practice one would find this period very much extended due to many factors concerned with the "minor administrative contretemps" inseparable in real life from mustering 4,000 men of different arms and units and running them through a "blood counting gauntlet" even if perfectly organised. For these I should allow at least a further 50 days.
 8. One now begins to wonder how reliable the figures would be from a technician, however skilled, if subjected to such satiation.
 9. Further, suppose some apparently normal men - as would inevitably happen, particularly on a single examination - were found to have unusually low or high counts, what policy would be adopted with regard to them. Would they have to be sent off the island for a prolonged period, and kept under observation? If so, where?
 10. Such wholesale blood examinations would inevitably raise alarm among many, and others would interpret them as a lack of confidence in the safety arrangements.
 11. In Atomic Energy Establishments where any counts considered necessary can be conveniently staggered throughout the year, very special counting devices have been devised to eliminate the human "error" inseparable even from the most practised technician.
 12. In view of all the above I have no hesitation in concluding that the Royal Air Force should not accept any such commitment - at best it would accumulate merely a mass of "normal" figures and at worst introduce more factors of confusion and uncertainty to the Trials Administration, which is already sufficiently loaded with responsibilities for individual safety.
- [REDACTED]
- [REDACTED]

From: [REDACTED]



0194 MAY 11
EST 10

Headquarters Task Force Grapple.
Air Ministry,
Whitehall Gardens,
London S.W.1

2nd July, 1958

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[REDACTED]

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We discussed two aspects of health physics yesterday and I think it appropriate to record our views.

Film Badges

Should film badges be issued to those serving at Christmas Island? It has not been thought necessary to issue film badges to date. Since radio-activity and contamination at the Island may occur only in certain areas the policy has been to define these areas and control entry and exit thereto, admitting only personnel both service and civilian [REDACTED] whose duty necessitates their working in these areas. These personnel have been given appropriate medical examinations (blood count) and are provided with film badges.

The remainder of the Island is not subject to contamination or radio-activity. However, as a wise insurance policy, counts are taken in all areas to ensure that backgrounds remain within limits. In lay language the count could be regarded as a communal film badge.

As we are now, for the first time, about to undertake balloon supported firings at Christmas Island, health physics for all at the Island comes under fresh examination in view of the possible differences between this type of firing and the high altitude air burst from the general radio-activity and contamination aspect. First thoughts suggest issue of film badges to all personnel. Further examination, however, indicates the wisdom of this policy to be questionable to say the least. If all personnel are to be issued with film badges, natives, both female and children, civilian merchant navy men in merchant ships and those in a similar category at the Island will have to be included. The administrative task (which of course must be met if essential) is considerable bearing in mind that the badge has to be issued, a record kept and the badge rechecked subsequent to examination for contamination after the holder has left the Island. Issue of badges at this stage may well provoke anxiety. What right have we to subject native populations and civilians to the possibility of contamination which, however remote, the issue of a badge to individuals would suggest is a likely possibility? Why should our present system of controlled areas not be extended to cover the requirements of balloon supported firings? Would this be adequate and safe?

First consideration of a film badge issue was provoked by the lego-medical aspect of disability claims. A case is now about to start and there may be some difficulty in disproving such claims. We discussed all this at some length at our meeting yesterday and our conclusion was that it would not be necessary for a general issue of film badges for Grapple Z, and that the present system of controlled areas would be safe and should continue. The Task Force will take the necessary steps to ensure that such areas are clearly

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marked in appropriate languages, controlled and defined in orders and that such orders are frequently repeated. Finally, all personnel who may have to enter these controlled areas are to be examined and issued with a personal film badge.

Blood Counts

At the moment the vast majority of service personnel at Christmas Island are not medically examined (blood counts) either prior to or after serving on the Island. However, contamination levels have been calculated on the assumption that all serving at the Island could be regarded as occupational workers and this category of personnel at [REDACTED] have medical tests (blood count). Those at the Island, other than [REDACTED] however, do not.

We discussed this matter at length and were of the opinion that measures should be put into effect at the earliest opportunity to ensure that all service personnel going to Christmas Island from now on were subject to medical examination (blood count). We also thought that medical test facilities should be set up at the Island immediately so that all personnel could be examined prior to the first Grapple Z firing. I have today put these two points verbally to [REDACTED] and [REDACTED]. They are not in favour of instituting a universal medical examination (blood count) and consider that our present system of controlled areas is adequate. They do believe, however, that it would be a wise precaution to institute a medical examination (blood count) for those Army and other personnel who are required to take part in rehabilitation work after balloon firings at the southeast end.

I would be grateful if you would confirm or otherwise the points I have made above as far as our meeting yesterday was concerned. I will then write to the H & R department asking them to confirm their advice on the medical examination (blood count) aspect for service personnel, and ask them to provide facilities for examination of those we propose to employ on rehabilitation. If the War Office and Admiralty accept the R.A.F. view, and I will put it to them, then I think we will be clear to go ahead.

