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OPERATION BUFFALO

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NOTE ON BIOLOGICAL PROGRAMME OF THE MEDICAL  
AND AGRICULTURAL RESEARCH COUNCILS

1. Introduction:-

Information on the exposure to external radiation which causes various degrees of damage to experimental animals can be obtained from laboratory experiments. Confirmatory data from field-trials are also available from the U.S. On the other hand the effects of ingestion of fission products deposited as fall-out can be much less readily gauged from laboratory studies, since the physical form of fall-out is known to be widely variable - ranging from virtually complete solubility at Hurricane (Monte Bello) to very low solubility following tower bursts. Information available from America permits only very partial assessments and the further investigation of this question is only possible at atomic weapon trials. For these reasons it is proposed to devote the maximum biological effort to the study of the hazards due to the ingestion of fall-out. These investigations which are directed primarily to civil defence purposes should also be of value in the assessment of possible sequelae of accidents to nuclear reactors.

1.2 Full use can be made of the opportunity Buffalo provides only if advice from Australian sources can be obtained in the planning of the work and active Australian participation is available during the operation. The object of these notes is to outline the general nature of the investigation and the type of assistance which is sought.

2. General Nature of Hazards due to the ingestion of Fall-out:-

2.1 The isotopes of iodine and of the alkaline earths, strontium and barium, are the main sources of hazard if they are in soluble form when the former is metabolically accumulated in the thyroid and the latter in the skeleton.

2.2 Human beings in a contaminated zone could absorb fission products from the air they breathe, from water or food onto which fission products had fallen or from the produce of animals which had previously ingested fission products.

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The relative extent of these different sources of hazard can be gauged against the tolerable levels of  $^{131}\text{I}$  in the atmosphere for continuous exposure. Present data suggest that the atmospheric content of  $^{131}\text{I}$  which is tolerable to man through breathing is over 1,000 times greater than that which could cause infants to receive the maximum permissible level of  $^{131}\text{I}$  from the milk of cows which grazed contaminated pastures. The deposition injuries to infants would also be injurious to cattle. The much greater hazard to cattle and to infants than to man is due to the wide areas from which grazing animals derive their food.

2.3 Hazards resulting from fall-out from an atomic or thermo-nuclear bomb explosion cannot as yet be as precisely assessed as those in continuous exposure but the evidence indicates strongly that under many circumstances fall-out which would not be a source of any direct hazard to man from external radiations could if deposited on edible herbage, be damaging both to grazing animals and to infants consuming milk.

2.4 On a long term basis the incorporation of  $^{90}\text{Sr}$  into the soil and its subsequent absorption by plants will give rise to the limiting hazard.

3. Proposed Programme at Buffalo:-

3.1 Since the facilities available at the trial site are necessarily limited it is intended whenever possible to collect fall-out samples and send them to the M.R.C. and A.R.C. laboratories in the United Kingdom which are equipped to investigate effects on both plants and animals. Samples of soil, and the native vegetation will be similarly collected.

3.2 Certain major questions, however, must be investigated on site especially:-

- (a) The extent to which airborne fission products lodge on the edible leaf tissue in normal pastures.
- (b) The fraction of the material present in the herbage consumed by grazing animals which is metabolically retained in them.
- (c) The relative importance of short lived nucleides.

It is on these questions that present data are particularly inadequate for the assessment of the "grazing" hazard. The absence of grassland resembling

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European pastures near the trial ground gives rise to particular problems and it is in overcoming these difficulties, that the advice from Australia is particularly requested at the present time. A possible method for undertaking the work is outlined below.

4. Proposed Experimental Plan

4.1 It is impracticable to grow areas of pasture on the trial area both because of physical difficulties and because the exact areas in which appropriate quantities of fall-out will occur cannot be predicted until the meteorological conditions of the trial are known. Facilities can, however, be provided for conveying boxes of growing herbage to appropriate sites and collecting them 1-2 days later. It is considered that if 50-100 boxes approximately half a square yard in area were thus used representative data could be obtained. It will be necessary for the leaf form and density of the herbage to resemble that of a well managed pasture. Apart from this the species cultivated are not important; either grass or a grass-clover mixture would be suitable. To obtain a suitably close stand it would be necessary either to sow the seeds several months before the trial or to transplant turf. A further reason for cultivating the grass well in advance of the trial is to enable it to become sufficiently well established to withstand drought. Before exposure the grass will be clipped to 3-6 inches in height to resemble a pasture at the time of grazing. As the trial ground will not be available until a few weeks in advance of the trial this will necessitate the establishment of the herbage elsewhere and transporting it.

4.2 Hitherto it has been impossible to seek Australian advice on this project. It is hoped that the above outline will enable suggestions to be made as to the manner in which this operation can be carried out. A point of particular importance is whether the grass is likely to survive 2-3 days without water in a condition from which it can be revived by watering if the soil in boxes is 6-9 inches deep and saturated before exposure. Watering devices could if necessary be provided.

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4.3 After the boxes have been brought back to the base laboratory investigations will be carried out to determine the fraction of the deposited material which could be ingested by grazing animals. Radiochemical and radioautographic procedures are available to assist in this assessment. The effect of artificial rain on the retention of fall-out on leaf tissue would also be studied.

4.4 While the dairy cow is the ruminant of greatest economic importance in Great Britain, the use of such animals at a field trial is likely to present greater difficulties than that of sheep.

To confirm predictions made from observations on the herbage itself, it is naturally desirable to present representative boxes of the pasture to wethers as food. These animals previously trained in the wearing of harness in metabolism stands<sup>x</sup> having cropped the contaminated diet can be studied to determine the gross amount of radioactivity rejected via the faeces and the total excreted in the urine. Serial sacrifice of the animals would give additional data on retention of absorbed radioactivity in the various tissues. As well as assay of the gross radioactivity absorbed, it should be possible to analyse for specific elements and their isotopes, notably iodine, tellurium, molybdenum, ruthenium, barrium and strontium, all of which are known to be absorbed from the gut under favourable conditions.

While ewes are much less satisfactory animals for the clear separation of urine and faeces it would be desirable to consider the use of at least one lactating ewe under crude "metabolism" conditions to obtain data on the secretion of radioactivity in milk.

On these points of training representative animals, of carrying out the experimental operations and of sacrifice and sampling the tissues, the advice of Australian consultants is welcomed.

<sup>x</sup> vide Dick & Mules (1954) Aust. J. Agric. Res. 5:345.

5. Facilities at site:-

Plans are being made to provide the accommodation and transport necessary to carry out the biological programme.

6. Staff

6.1 It has been suggested that a team of nine should be responsible for the M.R.C./A.R.C. programme. Of these five might be provided from the United Kingdom, two from the M.R.C., two from the A.R.C., and one R.A.M.C. representative who would have some responsibilities in other directions also.

It is hoped that the remaining four members of the team can be Australian. The appropriate scientific qualifications should embrace knowledge of pasture management, especially from the viewpoint of nutrition, and experience of the feeding habits and management of animals (e.g. sheep). If this collaboration is approved in principle, it is suggested that a first step should be the appointment of a senior Australian advisor with a wide knowledge of plant physiology and agricultural work. There would seem to be a considerable advantage in his being normally resident in Adelaide.

6.2 It is hoped that Australians attached to the team in the field will not only take responsibility for the preparatory work on herbage boxes etc., but also participate fully in all aspects of the work. It is suggested, however that consideration should first be confined to the provision of herbage boxes both because of the length of time which would be necessary to organise these and because details of the sampling and herbage evaluation programmes cannot yet be discussed in detail. It would clearly be of considerable advantage if at least one of the Australians attached to the team were in England during the course of this year. While this is not considered an essential requirement it is mentioned at this stage in case a suitable person is visiting England for other purposes.

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UNITED KINGDOM ATOMIC ENERGY AUTHORITY,  
Atomic Weapons Research Establishment  
Aldermaston,  
Berkshire.

22nd August, 1955.

Dear Wills,

Your letter to Mr. Letcher dated 27th June, giving the Austral proposals for a Target Response programme, was passed to me on the day that I had submitted to Buffalex a paper which compiled all the UK Target Response proposals. I attach six copies of this paper which is the result of many deliberations by the various Planning Committees concerned. In one or two cases, the committees are still deliberating, but the outcome is not likely to be very different.

As soon as we received your proposals, we had a meeting with Mr. Letcher and Leaders of the Target Response Groups who will carry out the programme at the trials. Your items were briefly discussed and each item passed to the appropriate Group for consideration and recommendation. These I have not yet had back

As you say in your covering letter, many of the items submitted by you are being covered by us, but there are quite a few that we think should be added to our lists. As soon as I receive the final lists from the Groups which will cover Australian and Canadian interests, I will publish them and send copies to you. They will probably require some action from you, particularly in supply of Australian proposed test items.

The attached lists give no details of the ranges of parameters: i.e. thermal, blast and radiological, to be covered. These will be included in the final lists, probably converted into distances, although we may hold off doing this to as late as possible consistent with the engineering programme, since these are experimental weapons and estimates of yields are likely to undergo a few changes. Certain items have been deleted temporarily from the Biological lists, since they have yet to receive UK-Australian policy blessing.

You will see in the paper an appendix 'H', which suggests the kind of representation we would like to see in the Groups from Australia and Canada.

I emphasize that it is only a suggestion; if you would like a different kind of expert covering these fields of interest, we should be glad to have your proposals.

I would like these fairly soon, as the Groups want to know what support they will be getting. I gather that it has been put to you that some of the representatives might come over here to familiarise themselves with the people and problems involved. It is true to say that each Group is relying on Australian and Canadian representatives to assist actively in conducting these tests, and are anxious that every member of the Group is conversant with all planning details, so that the maximum use can be made of the preparation time available.

However, you will no doubt be able to make your recommendation after you have been over here and met the various Group Leaders.

There remains the question of reporting on these tests, and here we are very conscious of the delays that have occurred in publishing and distributing information from past Trials, for

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for Schedule 7 all: Target Response  
Items incl. Biological.

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which we have been subjected to criticism both at home and overseas. Apart from the general difficulty of getting staff to write reports after the event, much of the trouble has been that each past trial has been an urgent ad hoc affair under a planning staff pressed into service from different departments, none of them with a continuing interest.

I have set up a small section with the task of progressing and streamlining report procedure, in the hope of getting them published and distributed within a few months of the Trials.

It is intended that each Group, although composed of representatives of different departments, will prepare a joint report and pass it through my Branch for processing and eventual publication by the AWRP Publishing Section.

Although the mechanics of the Australian and Canadian participation in the preparation of these reports may be difficult, I hope we can find a method whereby these representatives are involved in the preparation, so that they do, in fact, become joint reports.

Out of the turmoil of requirements on this Operation, we are now beginning to make some semblance of order, and hope soon to be able to begin writing the scientific plan for the Trial. However, I think we shall be able to give you a pretty full picture of what the whole operation will be like during your visit here, to which we are all looking forward.

Loxton and McGee have been hard at it since their arrival, digesting the vast mass of engineering detail that the installation of all the test items and recording instruments will require. They are now being taken round to various establishments to see some of the items involved, but naturally are reserving judgment on the extent to which they can meet our total requirements until they have got the complete story. It does look very likely that we shall have to make some cuts in the programme, but this we expected. I gather that they will see you before you leave Australia, and will be able to give you an account of their visit here.

Looking forward to seeing you soon.

Yours sincerely,

(SGD)

PEARSON

p.p. (J.T. Tomblin)

c.c. Dr. D.H. Black. (2 copies of enclosure).





BUFFALO BIOLOGICAL TRIALS TEAM

Copy No. 15  
Ref. No. OBBT/VA/

Report on Visit to Australia 26th September -  
6th October, 1955 by R. Scott Russell

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1. Object of the visit:-

The primary objects of the visit were:- to arrange for the selection of Australian members of Biological Trials Team with C.S.I.R.O.; to make plans for the provision of animals, herbage and equipment related to their maintenance, and to discuss with Australian Service departments the items they had proposed for inclusion in the programme of the Team. In addition it was arranged that the programme of the Team, and especially the use of animals, should be discussed with Australian scientists so that the basis of a statement could be prepared for public release by the appropriate authorities if they deem it necessary. The opportunity was also taken to continue discussions with Dr. Eddy on the collection of thyroids and bone samples from sheep 100 or more miles from Maralinga.

2. Itinerary:-

Sept. 26th: Arrived in Sydney from U.K. and proceeded to Melbourne for preliminary discussions with the following:-

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|-------------------|---|
| Mr. F.A. O'Connor | Secretary, Dept. of Supply              |
| Mr. W.S. Butement | Chief Scientist, Dept. of Supply        |
| Mr. E.L. Cook     | Assistant Secretary                     |
| Mr. W. O'Connor   | Secretary, Maralinga Committee          |
| Mr. J.H. Kitken   | R. & D. Branch, Dept. of Supply         |
| Cdr. Blackland    | R.N. Staff Officer, UKMOS (A)           |
|                   | (in absence of Dr. Black)               |
| Dr. F.R.G. White  | Chief Executive Officer, C.S.I.R.O.     |
| Mr. G. Grosford   | Secretary, C.S.I.R.O.                   |
| Mr. W. Worth      | Chief Security Officer, Dept. of Supply |
| Mr. L.P. Carter   | Security Officer, Maralinga.            |

General programme of visit was made out. It was arranged that prior to all discussions Security approval would be given by Mr. Worth or his representative, and that Mr. J.H. Kitken, the member of the Maralinga Committee responsible for Target Response would be present at all discussions affecting the work of the Team to be held in Melbourne and Adelaide.

Sept. 27th: Visit with Chief Scientist to see Professor L.H. Martin (Defence Scientific Adviser) and Dr. C.E. Eddy (Commonwealth X-Ray and Radiological Laboratory), members of the Maralinga Safety Committee. Discussed the preparation of a memorandum to be agreed by Prime Ministers of U.K. and Australia, and arranged for further discussion after return from Adelaide.

Proceeded to Adelaide in company with Dr. F.R. White.

Sept. 28th - 29th: Discussions in Adelaide with Dr. F.R. White, Professor J.G. Wood (Professor of Botany, Adelaide University), Mr. H.R. Marston, F.R.S. (Chief, C.S.I.R.O. Division of Biochemistry and General Nutrition), and Professor C.D. Donald (Professor of Agriculture, University of Adelaide), concerning general organisation, personnel and facilities for the Team. After these discussions Dr. White returned to Melbourne.

Discussion with Mr. ...V. Carter, Regional Security Officer, Department of Supply.

Sept. 30th: Visit to the Controller and the Superintendent W.R.E. Salisbury to discuss the provision of biological stores (including animals and herbage boxes).

Further discussions with Mr. Marston and members of his staff selected to cooperate with Biological Team.

Oct. 1st: Final plans for preparation of herbage boxes made with Professor Wood, Professor Donald and Mr. Packham (C.S.I.R.O. Division of Biochemistry).

Oct. 3rd: Return to Melbourne.

Visit to Sir Ian Clunies Ross and Dr. White to finalise general plans with C.S.I.R.O.

Discussion with Dr. Eddy on long range fall-out survey.

Visit to Dr. Black (U.K.M.O.S.)

Discussion with Major General W.D. Refshage, D.G.M.S. and Mr. R. Blunden, Scientific Advisor to Military Board, Australian Military Forces, and with Ft. Lt. Thirkelsen, R.A.A.F. on items proposed for Biological Team.

Oct. 4th: Discussion with Maralinga Safety Committee (Professor Martin, Mr. Butement and Dr. Eddy) on draft for statement on Biological work.

Further discussion with Maj. Gen. Refshage.

Final visits to Mr. F.L. O'Connor and other members of Department of Supply.

Proceeded to Canberra.

Discussion with Dr. O. Frankel, Chief C.S.I.R.O. Division of Plant Industry on the provision of a member for Trials Team.

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Oct. 5th: Visit to Professor Titterton (Safety Committee) on matters raised at meeting on 4th October.

Discussion with Mr. C.S. Christian, Chief C.S.I.R.O. Division of Land Research and Regional Survey on assistance in reconnaissance and provision of a member for the Trials Team.

Proceeded to Sydney.

Oct. 6th: Visit to Professor G.W. Emmons, Professor of Veterinary Physiology, University of Sydney, to arrange for him to advise on some aspects of the provision of animals.

Visit to Sir Jack Stevens, Australian Atomic Energy Authority.

Left Sydney for U.K.

5. Australian participation in Biological Trials Team:-

The discussions with Dr. White and other members of the C.S.I.R.O. led to the following arrangements being made:-

(a) Professor Wood and Mr. Marston would act as general advisors.

(b) Professor Emmons would advise on matters connected with small animals.

(c) Mr. Angus Packham (Tech. Sec. C.S.I.R.O. Division of Biochemistry and General Nutrition) would act as coordinator of Australian effort but would not be a permanent member of the Biological Team.

(d) Proposed following as Australian members of Team:-

- (i) Mr. I.G. Jarrett) Animal physiologists (C.S.I.R.O. Div. of Biochemistry and General Nutrition)
- (ii) Mr. B.J. Potter )

(iii), Mr. J.V. Possingham (Plant physiologist), C.S.I.R.O. Division of Plant Industry.

(iv) A member of C.S.I.R.O. Division of Land Research and Regional Survey to be selected by Mr. Christian, Chief of that Division.

(e) Professor Donald would supervise the preparation of herbage boxes.

(f) Mr. Christian would conduct a preliminary air reconnaissance to enable plans for the collection of herbage to be made.

Appendices I, II and III contain the detailed plans made regarding the animal studies, provision of herbage, and ecological reconnaissance respectively.

During the visit no definite plan concerning Mr. Possingham could be made since he is at present in the U.K. and his acceptance of nomination had not been obtained. He has since been interviewed and agreed to join the Team. Before returning to Australia he will receive training to enable him to assist in plant collecting and analytical work.

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4. Movement of animals and herbage to Maralinga:-

This would be provided by Department of Supply. It was suggested in discussion at W.R.E. that air transport will be desirable for animals -

- (a) to reduce public interest
- (b) to maintain animals in good condition.

If practicable the movement of herbage boxes by air would enable them to arrive in better condition.

5. Target Response items proposed by Australian armed forces:-

See Appendix IV. These proposals call for no additional facilities at Trial site.

6. Discussion with Maralinga Safety Committee:-

The object of preparing a draft was to enable the Committee to give information to the Australian Government if and when a public statement is considered desirable. It was emphasised, by Professor Titterton especially, that if questions raised in the Press or in Parliament demanded the issue of a statement, public reaction in Australia would be much more favourable if a statement could be issued immediately. He therefore considered prior agreement between the U.K. and Australia to be important.

7. Australian Atomic Energy Authority:-

A discussion with Sir Jack Stevens was suggested by members of the Safety Committee as they considered he would be interested in the organisation in the U.K. for work on the non-medical biological problems of atomic energy. A brief outline was given to him of the manner in which the A.R.C. programme is conducted. It was arranged that a liaison officer from the Authority, now in the U.K., would hold further discussions.

8. Collection of biological specimens at sites distant from the Target Area:-

Preliminary discussions with Dr. Eddy in Melbourne led to the suggestion that the possibility of C.S.I.R.O. Units in Adelaide collaborating in this work should be explored. It was ascertained that some years ago Mr. Marston had arranged for thyroids of sheep slaughtered for food to be collected from sheep stations covering a wide sector of Central Australia. Having considered the present interest in thyroid sampling, he offered his collaboration, noting that further work on thyroids from other viewpoints would be of academic interest to him. If his offer of assistance is accepted he would suggest that the collection be started early in 1956. The determination of  $^{131}\text{I}$  in the thyroids could be carried out in his Laboratory provided that suitable well-type scintillation counting equipment is provided. It would be arranged that bone samples for strontium determination would be collected also, but in all probability these would be dealt with by the A.R.C./M.R.C. organisation.

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These proposals were reported to Dr. Eddy who viewed them favourably, and it was arranged that he would hold further discussions with Mr. Marston and that the Biological Trials Team would approach A.R.E. for the provision of the necessary electronic equipment to Mr. Marston's Laboratory. An endeavour would also be made to arrange for a visit, lasting perhaps a week, by an electronic expert whose advice Mr. Marston would appreciate in a number of matters.

9. The writer desires to record his great indebtedness to those who assisted in the discussions here reported, especially to Dr. White and Mr. Marston of the C.S.I.R.O., to Professor Wood and to the Department of Supply. The rather congested programme could be followed only because Messrs. W. O'Connor and J.H. Attkin of the Department of Supply and the Departments security officers in Melbourne, Adelaide and Sydney devoted considerable effort to making the necessary arrangements.

Department of Agriculture  
University of Oxford  
17th October, 1955.

R. Scott Russell

Report on visit to Australia 26th September -  
6th October, 1955 by R. Scott Russell

Appendix I

PROPOSED PLANS AUSTRALIAN COLLABORATION  
IN ANIMAL INVESTIGATIONS

1. It has been agreed that the following members of the C.S.I.R.O. Division of Biochemistry and General Nutrition will assist:-

H.R. Marston, F.R.S., Chief of Division, to give general advice.

A. Packham, B.Sc., Technical Secretary, to be in charge of Australian organisation.

I.G. Jarrett, M.Sc., Physiologist (P.R.O.)

E.J. Potter, M.Sc., " (R.O.)

The two latter will be members of the Trials Team

It is hoped that Mr. Packham can be spared from Adelaide to join the team for a period of up to one week.

Professor G.W. Emmens, Sydney, will advise on certain aspects of the provision of small animals.

2. The duties of the two members of the Trials Team will be as follows:-

(a) To take charge of experimental animals from their despatch from Salisbury.

(b) To conduct experiments on sheep in collaboration with British members of the Team.

(c) To collaborate in the collection of native fauna.

(d) To transmit, as soon as possible, to the United Kingdom, comments on the provisional programme in so far as it affects the above.

3. Mr. A. Packham will be responsible for procuring supplies and for making any other arrangements necessary in Australia. The Superintendent, W.R.E., Salisbury, Mr. F.P. O'Grady, has been authorised by the Department of Supply to meet the Team's requirements and Mr. Packham will work in close association with Mr. O'Grady's office.

The principal services desired from the Department of Supply have been discussed in general outline with the Controller, W.R.E. and with Mr. F.P. O'Grady and no difficulties are anticipated.

4. As at present agreed the items to be arranged by Mr. Packham are:-

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- (a) Metabolism pens: 5 pens for wethers  
3 pens for ewes

Designs will be modified from standard pattern of C.S.I.R.O. Division of Biochemistry and General Nutrition in conjunction with W.R.E.

(b) Animals:

Sheep - as specified by C.S.I.R.O. Division of B. and G.N.

Mice - 300

Rabbits - 160

Goats - 30

Details will be supplied from U.K. on desired age, weight, colour, and type of animals other than sheep, and Professor G.W. Emmens, Sydney, will collaborate in their selection in Australia. Facilities for holding goats will be provided at W.R.E.; the other animals will be held by C.S.I.R.O., Division of Biochemistry and General Nutrition prior to despatch.

(c) Feeding Stuffs:

(i) Rations available in S. Australia for mice and rabbits together with rations available through Professor Emmens will be reported to U.K. by Mr. Packham.

(ii) Rations for sheep for 6 weeks and for goats for 4 weeks will be provided.

(d) Transit cages and pens:

Mice - 30 cages 12 x 6 x 6 in. (8 animals each)

Rabbits - 160 cages 18 x 10 x 15 in. (1 animal each)

Sheep and Goats - as specified by C.S.I.R.O., Division of B. and G.N.

(e) Special Exposure cages:

On receipt of details Mr. Packham will investigate Australian supply with the advice of Professor Emmens.

(f) 2 rifles and 2 shotguns plus ammunition for collection of local animals.

(g) 100 gin traps plus 500 numbered ear-tags.

(h) Typewriter, electric calculating machine, and moderate power microscope to be obtained on loan if possible.

(i) Consult C.S.I.R.O. on obtaining vivisection licenses for British members of biological Team.

(j) Consult W.R.E. regarding fire-arms licenses for 1 rifle and 1 shot gun to be brought from U.K.

(k) In conjunction with W.R.E. to supervise the arrival and onward despatch of Biological Team stores from U.K.

(l) Supervise supply of the following items detailed in programme for provision of herbage boxes (Appendix II):-

- (i) Provision of 250 plant boxes and planting of herbage.
- (ii) Artificial rain equipment
- (iii) Shelter.

5. Literature on subjects relevant to the biological work of the Team to be sent to the Australian members from U.K.

6. It was considered desirable that prior to the assembly of the Team at Maralinga Dr. Barnes, the M.R.C. physiologist in the Team, should visit the C.S.I.R.O. Division of Biochemistry and General Nutrition for perhaps two weeks so that fuller discussions could be held between him and the Australian members of the Team.

7. By arrangement with Mr. W. Worth, Chief Security Officer, Department of Supply, the Regional Security Officer, Department of Supply W. Australia, will provide all necessary advice and organise for mail to be forwarded by safe hand via A.S.L.O., London.

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BUFFALO BIOLOGICAL TRILLS TEAM

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Appendix II

PROPOSED PLANS FOR PROVISION OF HERBAGE BOXES

1. Professor J.G. Wood, Professor of Botany, University of Adelaide and Professor C.D. Donald, Professor of Agriculture, University of Adelaide, (Waite Research Institute) have agreed to advise. Mr. Packham will be in charge of administrative aspects.
2. 250 cordite boxes modified as specified will be prepared at W.R.E., Salisbury. Six carrying stretchers for boxes will be designed.
3. Compost/loam mixture sufficient to fill 240 boxes will be prepared under Professor Donald's direction at Waite Research Institute. Mr. Packham will arrange for transport, and repayment of labour and material costs through W.R.E. Salisbury.
4. 240 boxes will be planted at W.R.E. in a rabbit-proof enclosure preferably in November 1955. 120 boxes will contain perennial rye grass and 120 boxes perennial rye grass/clover mixture.
5. 10 empty boxes will be provided to C.S.I.R.O. Division of Biochemistry and General Nutrition for preliminary experiments.
6. Sufficient wire netting will be provided to screen 200 boxes in the field: this is estimated at 500 ft x 4 ft. wide of 1 inch mesh. 600 yards fine wire will be required for securing.
7. A simple device for giving artificial rain-fall will be devised.
8. A movable shelter consisting of scaffold poles and canvas approximately 10 x 10 ft, or suitable alternative, will be provided for working on boxes at Maralinga.
9. The Regional Security Officer, Department of Supply, South Australia, will supervise and advise on Security. Apart from Professor Donald those at Waite Research Institute responsible for procurement of soil will be informed only that it is to be used by W.R.E. Salisbury.

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BUFFALO BIOLOGICAL TRIALS TEAM

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BUFFALO FILE  
Report on Visit to  
6th October

Appendix III

Proposed plans for collaboration by members of  
Division of Land Research and Regional Survey, C.S.I.R.O.

1. It has been agreed that Mr. C.S. Christian, Chief, Division of Land Research and Regional Survey, C.S.I.R.O. will find a member (or 2 members) for the Team and will supervise a preliminary vegetational survey in the zone up to 100 miles distant from ground zero.
2. The object of the vegetation survey is to enable sites to be selected at which the deposition of fall-out can be correlated with
  - (a) the contamination of herbage of types consumed by grazing animals in the arid parts of Australia
  - (b) the absorption of fission products from the soil by ephemeral herbage can be studied in subsequent seasons if suitable arrangements can be made.
3. As a first step Mr. Christian will carry out a preliminary reconnaissance by air. This will be arranged through W.R.E. Salisbury by Mr. J. Litken, Department of Supply, Melbourne. It is hoped that a preliminary report will be available by the end of 1955.
4. Plans for future action cannot be decided until the results of preliminary reconnaissance are known. It is hoped however that the exposure of sticky paper for fall-out collection and the collection of herbage, can be undertaken by at least one mobile unit in close coordination with the Health Physics Organisation.
5. The collaboration of the Division of Land Research and Regional Survey holds promise of a far more satisfactory organisation for the collection of herbage samples than was originally envisaged. It is hoped that the work can be carried out by mobile teams not based on Maralinga. It is particularly desirable that this arrangement can be approved since the survey should provide direct evidence regarding the fraction of the fall-out deposited on herbage which grazing sheep could consume.

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11.

Appendix IV

Australian Service Requirements

A. AUSTRALIAN ARMY

Discussions with Major General W.D. Refshage, C.B.E., D.G.M.S., and Mr. R. Blunden, Scientific Advisor to Military Board Australian Military Forces led to the following conclusions regarding tasks proposed by Australia.

1. Exposure of Ration Packs:- (items 1(b), 2 and 3 of Australian list). It was noted that U.K. Service Departments had not proposed corresponding items but that the Ministry of Agriculture, Fisheries and Food's programme would cover much of proposed ground regarding neutron induced activity. An endeavour would be made by A.M.F. to obtain further information from British sources. Pending its receipt the possibility would be borne in mind that rations could be exposed in the containers provided to hold Ministry of Agriculture, Fisheries and Food targets. It was realised that no detailed radiochemical analyses could be made by the Biological Trials Team.
2. Blood transfusion equipment:- (item 4 of Australian list) It was noted that this proposal contrasted with U.K. plans in that liquid serum is used by Australian Medical Services whereas dried plasma is used by U.K. Services. It was considered desirable that both materials be exposed together and it was arranged that Australian services will provide details of items they wish to include.
3. Medical supplies:- (items 5 - 8 of Australian list) It was realised that the programme of exposing a number of types of Medical and Surgical Pannier was unduly complicated in view of U.K. proposals. At the same time the comparison of U.K. and Australian panniers which contrast in structure was desirable. Australian services would therefore suggest a composite pannier to be exposed beside British panniers. 6 such panniers would be required.
4. Burns packs:- As these are to be introduced into Australian services the results of exposing them will be awaited with particular interest.
5. The D.G.M.S. Australian M.F. expressed satisfaction that ground contamination in relation to food production was under investigation.

B. ROYAL AUSTRALIAN AIR FORCE

Proposals were discussed with Ft.Lt. Thirkelsen, T.D.

1362

UK/ UNCLASSIFIED 828

BR/28/7

1. Exposure of ration packs:- (item 1(a) of Australian list) after discussion this proposal was withdrawn.

It is to be noted that the R.A.A.F. and Army ration packs are similar. The latter are referred to in para 1 above.

2. Medical supplies:- (items 9 and 10 of Australian list) Withdrawn in view of British programme.

3. Spray, insecticidal powder:- (item 11 of Australian list) This equipment, 18 x 18 x 14" and weighing 70 lbs. approx, is of vital importance in malarial regions. Information on its survival of blast, etc. is desired. It was agreed that details would be supplied to U.K. so that the manner of gaining information could be considered.

4. Water filter:- (item 12 of Australian list) This consists of a covered metal drum enclosing felt pads. The objects of the proposal were to ascertain if neutron or gamma irradiation would injure pads at distances at which blast injury did not cause damage to drum, i.e. at approx. 1,800 yds. from ground zero of nominal bomb. It was explained that no reduction of efficiency of filter pads was to be expected under these circumstances and that a definite statement on this question would be supplied. With this assurance it was agreed to drop the proposals.

ROYAL AIR FORCE

Proposals are discussed with Lt. Col. Wilkinson, R.A.F.



3216.



1324 153

OUTWARD TELEPRINTER MESSAGE

URGENT

UK/ UNCLASSIFIED 88

TO: LLOYD  
FROM: BLACK

BR/28/8

EXBUF NO...!2.....

FROM PROFESSOR EMMENS TO SCOTT-RUSSELL.

"I HAVE DISCUSSED THE RABBIT SITUATION WITH PACKHAM, WHO CANNOT SUPPLY YOUR EXACT REQUIREMENTS. THE BEST HE CAN DO IS 140 DOES OF WHICH SOME ARE NOW 6-8 WEEKS OLD AND SOME WILL BE BORN AS LATE AS NEXT FEBRUARY. THEY CAN BE ALL FEMALES, BUT OF ANY COLOUR AND WEIGHT.

I HAVE FOUND THAT THE C.S.I.R.O. ANIMAL GENETICS SECTION IN THIS UNIVERSITY (THE ONLY PLACE IN AUSTRALIA WHO COULD HELP) COULD, IF APPROACHED, PROBABLY SUPPLY VERY NEAR TO SPECIFICATION IF GIVEN THE ORDER SOON. IF THE RABBITS ARE TO BE WHITE FEMALE AND REASONABLY HOMOGENOUS IN OTHER WAYS, THE WEIGHT RANGE WOULD BE MORE LIKE  $2.0 \pm 0.5$  KG, BUT IF ANY COLOUR WERE ACCEPTABLE AND PARTICULARLY IF EITHER SEX WERE ACCEPTABLE A RANGE OF  $2.5 \pm .025$  KG MIGHT BE POSSIBLE.

PLEASE LET ME KNOW IMMEDIATELY IF THE NARROW WEIGHT RANGE AND COLOUR ARE ESSENTIAL, IF NOT, PACKHAM NEED NOT BE ASKED TO MAKE NEW ARRANGEMENTS, BUT IF THEY REALLY ARE, THEN WE COULD DO BETTER FROM HERE. HE IS NATURALLY MOST ANXIOUS FOR A QUICK REPLY."

*Answers received  
28/11/55  
to Emmons through  
Regional Accountant  
by G. Black  
26*

*Lowcastle*

28/11/55

*Biological Program*

UK ~~UNCLASSIFIED~~ *08*

18th November, 1955.

BR/28/9

Dear Angus,

The War Office and Professor Zuckermann's people have now made progress regarding the exposure cages for their animals, and they would like them constructed in Australia. I enclose photographs of types they would like copied. You will notice that they are made with clips so that they can be fixed to scaffold poles. I enclose two photographs of the rabbit cages and three of the mouse cages from different angles. We would like to explore the possibility of manufacture in Australia forthwith. If W.R.A. is prepared to make them at Salisbury it would, I imagine, undoubtedly be the cheapest method. The numbers required are approximately:-

- Rabbits - 140
- Mice - 20

To facilitate collaboration at W.R.A. I am writing to Aitken, and I am also telling Professor Emms what is afoot since if W.R.A. is not able to manufacture them the most convenient arrangement might be to have them manufactured by the firm which at present makes special cages for him. I would suggest that in any case you get in touch with Professor Emms, to whom I am writing and enclosing a copy of this letter. The member of the War Office directly responsible for this is Mr. E.R. Drake Sanger, Room 136, Montague House Annex, The War Office, London, S.W.1, and it would save unnecessary complication in correspondence if queries regarding any details of design were dealt with direct with him.

I will be interested to hear how matters are progressing. A good deal of high level correspondence has been inspired at this end! I will be writing to you in the near future regarding a number of other matters, of which the only difficult item will, I believe, be goat cages.

With very good wishes,

Yours,

R. Scott Russell

Angus Macdonald, F.S.G.,  
C.S.I.R.O. Division of Biochemistry and General Nutrition  
University of Adelaide

Copies for information to:- Lt.Col. J.G. Crook  
Mr. E.R. Drake Sanger  
Professor G. Emms, Mr. J.R. Aitken ✓

DEPARTMENT OF AGRICULTURE  
UNIVERSITY OF OXFORD  
TELEPHONE OXFORD 57245

159

UK UNCLASSIFIED

(Safe Hand)

18th November, 1955.

Biological Programme

BR/28/10

Dear Jack,

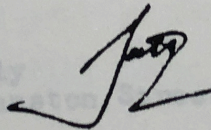
I enclose a copy of a letter I have sent to Packham regarding exposure cages. It seemed a good idea to let you know that this is coming up, and I have suggested tackling Salisbury since both during my visit and in a subsequent discussion with Wills I have been so much encouraged to attempt to exploit your good offices! If this request is in any way unreasonable please just have Packham told that he should go to a commercial firm.

Now that I am writing I would mention that I would be extremely interested if before the middle of December I could hear if any progress has been made regarding the survey in the fall-out zone. We are having a rather important meeting at Aldermaston on 16th December, and if either by letter or by teleprinter you could have me informed of any progress which has been made before that date I would be deeply grateful.

Winter draws on here and I think somewhat jealously of you in sunshine and peace in Swanston Street.

Kind regards,

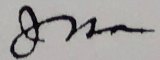
Yours sincerely,



R. Scott Russell

J.H. Aitken, Esq.  
Department of Supply  
6th Floor, 339 Swanston Street  
Melbourne

Copy for information to Lt. Col. J.C. Crook





DEPARTMENT OF AGRICULTURE  
UNIVERSITY OF OXFORD  
TELEPHONE OXFORD 57245

160

12th December, 1955.

*Biological*

UK/ UNCLASSIFIED

*208*

Dear Jack,

The Biology Group again - The War Office has asked me to explore the manufacture in Australia of some relatively simple boxes for some glass fragmentation tests. I have sent the plans to Packham, suggesting that he discusses them with W.R.E. in the first instance. I would be deeply grateful if you expedited this if necessary, and I only hope that Wills, O'Connor and you do not feel that I am asking for too much.

With kind regards,

Yours,

BR/28/11

R. Scott Russell

*When Packham if I can help*

*2012  
23/12*

J.H. Aitken, Esq.  
Department of Supply  
6th Floor, 339 Swanston Street  
Melbourne

Copy for information to Lt.Col. J.C. Crook

14th December, 1955

UK/DECLASSIFIED  
TELEPRINTER TO LONDON

164

ML ...3542

IMMEDIATE

TO: LLOYD FOR TOMBLIN AND SCOTT RUSSELL  
FROM: BLACK

BR/28/12

EXBUFR ...26...

FOLLOWING FROM WILLS.  
PLEASE ADVISE ALDERMASTON CONFERENCE THAT RABBITS CAN BE MADE AVAILABLE WITHIN SPECIFIED WEIGHT RANGE AT 135 TO 145 DAYS OF AGE. 250 MUST BE BRED AND MAINTAINED BY RENDEL TO ALLOW SELECTION OF 160 TO BE FLOWN TO LOCATION A WEEK BEFORE REQUIRED. RENDEL WOULD REQUIRE 250 MAINTENANCE CAGES 160 OF WHICH CAN ACCOMPANY RABBITS SELECTED. GROWTH DURING ANY DELAYS WOULD INCREASE WEIGHT. THESE PROBLEMS ARISE BECAUSE RABBITS HAVE NOT STOPPED GROWING AT WEIGHTS SPECIFIED. THEREFORE ADVICE OF DATE REQUIRED NECESSARY AT LEAST 175 DAYS THAT IS 145 PLUS 30 DAYS GESTATION BEFOREHAND. NO BREEDING WILL START UNTIL YOU ADVISE.

*John (D.H.B.)*

14th December, 1955.

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167

OK/ UNCLASSIFIED  
TELEPRINTER TO LONDON 88

TO: LLOYD  
FROM: BLACK

BR/28/13

FOR SCOTT RUSSELL AT A.W.R.F.

FXBUF .....

FOLLOWING FROM MARSTON THROUGH WILLS.  
GREETINGS. HAVE PREPARED COMMENTRY ON THOSE PARTS  
OF OPERATION IN WHICH WE HAVE AGREED TO ASSIST AND  
HAVE SET DOWN SPECIFIC PROPOSALS AS TO CONDUCT AND  
DETAILS OF EXPERIMENTAL PROCEDURES. SORRY COULD NOT  
COMPLETE DOCUMENT IN TIME FOR MEETING. ALL ARRANGEMENTS  
HERE WELL IN HAND. HAVE REDESIGNED METABOLISM CAGES  
ESPECIALLY FOR TASK AND SALISBURY HAVE CONSTRUCTED THEM.  
TRAINING ANIMALS BEGINS LATE JANUARY.

*W. Russell*  
15th Dec. 1955.

168

132/1w

UK/ ~~SECRET~~ UNCLASSIFIED



BR/28/14

Lm 3822

TO BLACK  
FROM LLOYD

FROM [faded]  
RIFEX 33

FOR MILLS FROM TOMBLIN . <sup>SCOTT</sup> ~~1955~~ RUSSELL.

REF NSA 15070 AND NSA 15349  
FROM REFERENCE EXRUF 26. SENDS ANIMALS ACCEPTABLE AGE  
145 DAYS AT AUGUST 1ST ++  
... BUT SOME IDENTIFICATION  
FORM. COULD PERRY BE CONTACTED AND ARRANGEMENTS MADE TO  
DISTRIBUTION EITHER FROM W OCONNOR OR MYSELF BEFORE HE  
ORIGINATOR LLOYD ++  
PLEASE ADVISE  
19.12.55 ++  
REPTU L43822 33 26 145 1ST 69.12.55 ++ NM ++

TYPE 3.35..9.1.36..JBS

UK UNCLASSIFIED

187

SAM 106  
TO LADE  
FROM REID

*Redesign B Program*

BR/28/15

SA 5311/15

REF MSA 15070 AND MSA 15349  
FROM AITKEN 22 ND DEC . SECURITY WILL BE MOST UPSET IF PERRY  
ARRIVEF AT MARALINGA WITHOUT SOME IDENTIFICATION  
FORM. COULD PERRY BE CONTACTED AND ARRANGEMENTS MADE TO  
ISSUE AN I M F EITHER FROM W OCONNOR OR MYSELF BEFORE HE  
LEAVES ADELAIDE. PLEASE ADVISE

R O U T I N E

TIME SALS 3.35..5.1.56..JBS

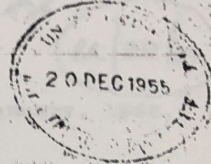
*Adrian Paddock*  
*20/12*  
*9:00*

UK UNCLASSIFIED

169

n 3822

BLH3922



TO BLACK  
FROM LLOYD

*Biological Programme*

BUFEX 33

*Hand 20/11*  
FOR WILLS FROM TOMBLIN, ~~LLOYD~~ SCOTT RUSSELL.

BR/28/15

REFERENCE EXBUF 26. RENDELS ANIMALS ACCEPTABLE AGE  
145 DAYS AT AUGUST 1ST ++

DISTRIBUTION

ORIGINATOR LLOYD ++

19.12.55 ++

REPTN LM3822 33 26 145 1ST 69.12.55 ++ NM ++

R. Scott Russell

*Advised Packham  
20/12  
Dms*

J.S. Atken, Esq.  
Department of Supply  
5th Floor, 359-361 Swanston Street  
Melbourne, Australia

*Always send to Packham 20/12/55*

UK/ UNCLASSIFIED  
DEPARTMENT OF AGRICULTURE  
UNIVERSITY OF OXFORD  
TELEPHONE OXFORD 57245

195

BR/28/17

2nd January, 1956.

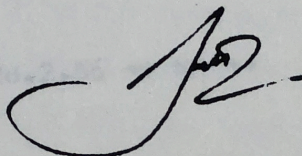
*Biological*

Dear Jack,

May I bother you on a small matter? When I reached Melbourne from Adelaide I asked you if you would be so kind as to have a roll of plans of metabolism cages which Marston had lent me sent over to England. They have not arrived. I have not checked this earlier as they might possibly have come by sea mail, and that takes a long time. As I gather the plans are of value to Marston, I would be most grateful if you would look into the matter. If by any chance they have not left Australia I would suggest that they be returned to him.

With all good wishes for the New Year.

Yours sincerely,



R. Scott Russell

J.H. Aitken, Esq.  
Department of Supply  
6th Floor, 339 Swanston Street  
Melbourne, Australia

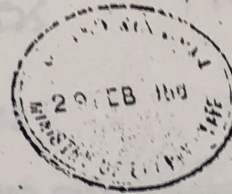
*Drawings sent to Packham 23/1/56 with  
copy of the letter*

*J.H.A.*

LN4723  
TO WHEELER  
FROM LLOYD

BUFEX 65

UK/ ~~UNCLASSIFIED~~ *eds*



FOR WILLS FROM PEARSON. NO REPEAT NO CONFIRMATION YET RECEIVED  
TO SIGNAL BUFEX 59 ASKING IF ~~STRATIX~~ STRATHMORE UNLOADED  
STORES AT FREMANTLE AND THAT STORES ARE BEING  
TRANSPORTED TO MELBOURNE. AN IMMEDIATE REPLY IS REQUESTED ++

DISTRIBUTION

ORIGINATOR LLOYD ++

28.2.56 ++

REPTN LN4723 65 59 28.2.56 ++ NM ++

BR/28/17

*for info only, has been forwarded to release*

*Jim*



147  
BLACK  
LLOYD  
DIFEX 47

Biological  
UNCLASSIFIED

1321/12 197

BR | 28/18

PASS TO MARSTON CSIRO DIVISION OF BIOCHEMISTRY AND GENETICS GENERAL  
NUTRITION UNIVERSITY OF ADELAIDE FROM SCOTT-RUSSELL.

YOUR LETTER OF 21ST DECEMBER AND PLANS ARE OF IMMENSE VALUE  
TO MRC/ARC GROUP AND GREATLY APPRECIATED. ADVICE IN PARAGRAPH  
3 BEING FOLLOWED IMMEDIATELY. AGREED THAT MANY DETAILS OF SHEEP  
EXPERIMENTS ARE BEST DISCUSSED IN PERSON. LET ME KNOW IF YOU WOULD  
BE AVAILABLE FOR DETAILED DISCUSSIONS WITH BARNES, PHYSIOLOGIST  
AND MYSELF IN LAST HALF OF JULY ON ASPECTS WHICH DO NOT AFFECT  
LONG TERM PLANNING. A DETAILED STATEMENT ON YOUR COMMENTS  
ON OUR BRIEF SUMMARY OF PLANS FOR SHEEP EXPERIMENTS IS IN  
PREPARATION BUT ITS FINAL FORM WILL BE MUCH INFLUENCED BY YOUR  
REPLY TO ABOVE QUESTION ++

DISTRIBUTION

ORIGINATOR LLOYD

18.1.56 ++

REPTV LM4147 47 CSIRO 21ST MRC/ARC 3 18.1.56 ++ NM ++

Mk Wells - for info. Copy has been forwarded  
to Adelaide.

20/1.  
gm  
20/1.

UK/ UNCLASSIFIED

*Unclas* 199

TELEPRINTER TO LONDON

HL.....3923

*Biological*



TO: LLOYD FOR SCOTT RUSSELL AND DRAKE-SEAGER  
FROM: BLACK

FOLLOWING FROM WILLS

BR/28/19

EXBUP ...41...

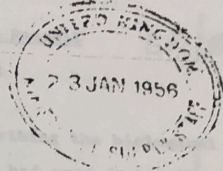
MANUFACTURE OF BLAST BOXES WITH GLASS PANELS IS BEING  
UNDERTAKEN BY W.R.E. SALISBURY. PACKMAN AGREES THAT  
MANUFACTURING QUERIES CAN BE REFERRED DIRECTLY W.R.E.  
TO DRAKE-SEAGER AND VICE VERSA.

*J. K. Miller* 18.1.56.

UK/UNCLASSIFIED

204

TELEPRINTER TO LONDON



ML.....3976

TO: LLOYD FOR SCOTT RUSSELL  
FROM: BLACK

BR/28/20

FOLLOWING FROM WILLS FOR PACKHAM

EXBUP ...4.3.

SUPPLY OF DIMENSIONS AND WEIGHTS AS REQUESTED IN YOUR  
LETTER OF 19TH DECEMBER PRESENTS PROBLEMS. W.R.F.  
SUGGEST MATTER BE DISCUSSED BY ME WITH SAXBY 1ST FEBRUARY.

23.1.56

- (i) Provision of small animals: rabbits, mice and guinea pigs.
- (ii) The construction of suitable cages.

Draft

UK/UNCLASSIFIED

214

203 207

Meeting between Mr. Wills and Dr. Scott Russell  
on Thursday, 22nd September, 1955

BR/28/21

Mr. Wills said that Dr. Loutit's document describing the biological experiments had been received in Australia. CSIRO had agreed that <sup>Mr. F. White</sup> should be asked to organise the Australian participation in this work. However, a detailed working plan is required. Dr. Scott Russell said that it had been impossible to give a detailed plan until approval had been received for the inclusion of animals in the programme. This approval has now been received and he is taking out a detailed plan of the experiments. Mr. Wills said that CSIRO is quite willing to provide staff and facilities needed in Adelaide, and field equipment where required. Department of Supply will arrange to purchase or <sup>any</sup> manufacture <sup>h</sup> pasture boxes required and will furnish other material facilities, transport, etc. Mr. Loxton or Mr. Atkin <sup>at</sup> will be able to discuss this in Australia. Mr. Wills said that Professor Wood did not wish to take too much responsibility <sup>in the</sup> for suggested measurements, and suggested that a small panel should be set up to ~~discuss~~ <sup>act as the Australian advisory committee.</sup>

Mr. Wills asked Dr. Scott Russell to explain the position of Dr. Emmans. Dr. Scott Russell said that Dr. Emmans is a scientist in close contact with Professor ~~Smith~~ Zuckerman, who as Scientific Adviser to the War Office on physiological programmes has originated the experiments on the effect of blast on animals in this trial. Dr. Scott Russell said that at the trial the following <sup>will be</sup> ~~was~~ required <sup>experiments</sup>; it is hoped, from Australian connection with Prof Zuckerman

- (i) Provision of small animals: rabbits, mice and goats.
- (ii) The construction of suitable cages.

In so far as advice may be required on this in Australia, it is believed that Dr. Emmans is the most informed Australian scientist. Australia House have already asked White, if CSIRO and Security agree, that this matter should be to discussed <sup>with</sup> Emmans.

Mr. Herfington said that Mr. Butement, Chief Scientist, Department of Supply was going to talk to <sup>Dr.</sup> ~~But~~ White about this problem.

In answer to Mr. Wills, Dr. Scott Russell said that War Office have <sup>a type</sup> of rabbit cage in UK which could be made available to Australia for copying if required. It was agreed that both Mr. Atkin and Dr. Emmans could profitably take part in

UK/UNCLASSIFIED

discussions on this subject.

In answer to Mr. Wills, Dr. Scott Russell outlined his ideas of the type of Australian assistance which might be required. These are:-

- (a) Two <sup>men</sup> ~~at the minimum~~ for laboratory work.
- (b) One man mainly employed as an animal husbandry expert.
- (c) A general man for laboratory work who, it is suggested, might be a Rhodes scholar now in <sup>UK</sup> ~~America~~ and shortly expected to join the staff of CSIRO.

Dr. Scott Russell said that he will return to UK on the 9th October, and it was agreed that a meeting between Dr. Scott Russell and Mr. Wills should be arranged by Captain Saxby.

In answer to Mr. Herfington, it was agreed that it will be desirable to produce a suitably worded statement to give to the Press, and Dr. Scott Russell agreed to consider with Mr. Buteament and Mr. White the wording of such a ~~statement~~ announcement.

Report on Visit to Australia 26th September - 6th October, 1955  
 by Scott Russell

UK/UNCLASSIFIED BR

BR/28/22

1. Object of the visit:-

The primary objects of the visit were to arrange for the selection of Australian members of Biological Trials Team in with C.S.I.R.O.; to make plans for the provision of animals, herbage and equipment related their maintenance, and to discuss with Australian Service departments the items they had proposed for inclusion in the programme of the team. In addition it was arranged that the programme of the Team, and especially the use of animals, should be discussed with Australian scientists so that the basis of a statement could be prepared for public release by the appropriate authorities if they deem it necessary. The opportunity was also taken to continue discussions with Dr. Eddy on the collection of thyroids and bone samples from sheep 100 or more miles from Maralinga.

2. Itinerary:

Sept. 26th. Arrived in Sydney from U.K. and proceeded to Melbourne for preliminary discussions with the following:-

- |                     |  |
|---------------------|--|
| Mr. F.A. O'Connor   | Secretary, Dept. of Supply                                 |
| Mr. W.A.S. Eutement | Chief Scientist, Dept. of Supply                           |
| Mr. E.L. Cook       | Asst. Secretary  |
| Mr. W. O'Connor     | Secretary Maralinga Committee                              |
| Mr. J.H. Aitken     | R. & D. Branch, Dept. of Supply                            |
| Cdr. Blexland       | R.N. Staff Officer, UIMOSS(A)<br>(in absence of Dr. Flack) |
| Dr. F.R.G. White    | Chief Executive Officer, C.S.I.R.O.                        |
| Mr. G. Grosford     | Secretary, C.S.I.R.O.                                      |
| Mr. W. Worth        | Chief Security Officer, Dept. of Sup                       |
| Mr. L.P. Carter     | Security Officer, Maralinga.                               |

General programme of visit was made out. It was arranged that prior to all discussions security approval would be given by Mr. Worth or his representative and that Mr. J.H. Aitken, the member of the Maralinga Committee responsible for Target Response would be present at all discussions affecting the work of the team to be held in Melbourne and Adelaide.

Sept. 27th Visit with Chief Scientist to see Professor L.H. Martin (Defence Scientific Adviser) and Dr. C.E. Eddy (Commonwealth X-Ray and Radiological Laboratory), members of the Maralinga Safety Committee. Discussed the preparation of a memorandum to be agreed by Prime Ministers of U.K. and Australia, and arranged for further discussion after return from Adelaide.

Proceeded to Adelaide in company with Dr. P.F. White.

Sept. 28th - 29th

Discussions in Adelaide with Dr. P.F. White, Professor J.G. Wood (Professor of Botany, Adelaide University), Mr. Hedley R. Marston, F.R.S. (Chief, C.S.I.R.O. Division of Biochemistry and General Nutrition), and Professor C.D. Donald (Professor of Agriculture, University of Adelaide) concerning general organisation, personnel facilities for the Team. After these discussions Dr. White returned to Melbourne. Discussion with Mr. A.V. Carter, Regional Security Officer, Department of Supply.

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Sept. 30th Visit to the Central Veterinary Superintendent  
W.R.E. Salisbury to discuss the provision of  
biological stores (including animals and herbage  
boxes).

Further discussions with Mr. Kerston and  
members of his staff selected to cooperate with  
Biological Team.

Oct. 1st Final plans for preparation of herbage boxes  
made with Professor Wool, Professor Donald and  
Mr. Lachkar (C.S.I.R.C. Division of Biochemistry)

Oct. 3rd Return to Melbourne. [Visit to Sir Ian Clunies  
Ross and Dr. White to finalise general plans  
with C.S.I.R.C. [Discussion with Dr. Eddy on  
long range fall-out survey. [Visit to Dr. Black.  
(U.S.N.O.S. C.A.). [Discussion with Maj. General  
W.D. Refshage, D.G.M.S. and Mr. R. Blunden, Scien-  
tific Advisor to Military Board, Australian  
Military Forces, and with Pt. Lt. Thirkelsen, R.A.  
on items proposed for Biological Team.

Oct. 4th Discussion with Marketing Safety Committee  
(Professor Martin, Mr. ~~Butcher~~ and Dr. Eddy)  
on draft for statement on Biological work.  
→ Further discussion with Maj. Gen. Refshage.  
→ Final visits to Mr. P.A. O'Connor and other members  
of Department of Supply.

proceeded to Canberra.

Discussion with Dr. O. Frankel, Chief,  
C.S.I.R.C. Division of Plant Industry on the pro-  
vision of a member for Trials Team.



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Oct. 5th Visit to Professor [redacted] (Society Committee) on matters raised at meeting on 4th October.

Discussion with Mr. C.S. Christian, Chief C.S.I.R.O. Division of Land Research and Regional Survey on assistance in reconnaissance and provision of a member for the Trials Team.

Proceeded to Sydney.

Oct. 6th Visit to Professor G.W. Emmens, Professor of Veterinary Physiology, University of Sydney, to arrange for him to advise on some aspects of the provision of animals ~~for the Trials~~

Visit to Sir Jack Stevens, Australian Atomic Energy Authority.

Left Sydney for U.K.

5. Australian participation in Biological Trials Team:-

The discussions with Dr. White and other members of the C.S.I.R.O. led to the following arrangements being made:-

(a) Professor Wood and Mr. Marston would act as general advisors

(b) Professor Emmens would advise on matters connected with small animals.

(c) Mr. Angus Lackham (Tech. Sec. C.S.I.R.O. Division of Biochemistry and General Nutrition) would act as coordinator of Australian effort but would not be a permanent member of the Biological Team.

(d) Proposed following as Australian members of Team:-

(i) Mr. I.G. Jarrett) Animal physiologists (C.S.I.R.O.)

(ii) Mr. E.J. Lotter ) Div. of Biochemistry and General Nutrition) CSIRO

(iii) Mr. J.V. Possingham (Plant physiologist) / Division of Plant Industry.

(iv) A member of C.S.I.R.O. Division of Land Research and Regional Survey to be selected by Mr. Christian, Chief of that Division.

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- (e) Professor Donald would supervise the preparation of herbage boxes.
- (f) Mr. Christian <sup>would</sup> ~~will~~ conduct a preliminary air reconnaissance to enable plans for the collection of herbage to be made.

Appendices I, II and III contain the detailed ~~plan~~ plans made regarding the Animal Studies, provision of herbage, and ecological reconnaissance respectively.

During the visit no definite plan concerning Mr. Tossingham could be made since he is at present in the U.K. and his acceptance of nomination had not been obtained. He has since been interviewed and agreed to join the team. Before returning to Australia he will receive training to enable him to assist in plant collecting and analytical work.

4. Movement of Animals and Herbage to Mafalinga:-

This would be provided by Department of Supply. It was considered <sup>in discussion at W.R.E.</sup> that air transport will be desirable for animals -

- (a) to reduce public interest
- (b) to maintain animals in good conditions.

If practicable the movement of herbage boxes by air would enable them to arrive in better condition.

5. Target response items proposed by Australian armed forces:-

See Appendix IV. These proposals call for no additional facilities at Trial site.

6. Discussion with Mafalinga Safety Committee:-

A draft ~~draft~~ up with the Committee is shown in Appendix V. The object of preparing this ~~draft~~ draft was to enable the Committee to give information to the Australian Government if and when a public statement is considered desirable. It was emphasised, by Professor Titterton especially, that if questions are raised in the press or in Parliament ~~the~~ ~~Committee~~ demanded the issue of a statement, public reaction

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<sup>in Australia</sup> would be much more favourable if a statement could be issued immediately. He therefore considered prior agreement between the U.K. and Australia to be important.

7. Australian Atomic Energy Authority:-

A discussion with Sir Jack Stevens was suggested by members of the Safety Committee as they considered he would be interested in the organisation of work on the non-medical biological problems of Atomic Energy in the U.K. A brief outline was given to him of the manner in which the A.R.C. programme is conducted. It was arranged that a liaison officer from the Authority, now in the U.K., would hold further discussions.

8. Collection of biological specimens at sites distant from the Target Area:-

Preliminary discussions with Dr. Eddy in Melbourne led to the suggestion that the possibility of C.S.I.R.O. units in Adelaide collaborating in this work should be explored. ~~It was ascertained~~ <sup>Mr Harold Marston</sup> that some years ago ~~had~~ had arranged for thyroids of sheep slaughtered for food to be preserved at sheep stations covering a wide sector of Central Australia. Having considered the present interest in thyroid sampling, he offered his collaboration, noting that further work on thyroids <sup>from other viewpoints</sup> would be of academic interest to him. If his offer of assistance <sup>is</sup> accepted he would suggest that the collection be started early in 1956. The determination of <sup>I<sup>131</sup></sup> ~~I<sup>131</sup>~~ in the thyroids could be carried out in his Laboratory provided that a suitable well-type scintillation counter <sup>is</sup> ~~was~~ provided. It would be arranged that bovine samples for ~~the~~ strontium determination would be collected also, but in all probability these would be dealt with by the A.R.C./M.R.C. organisation. ] These proposals were reported to Dr. Eddy who viewed them favourably, and it was arranged that he would hold further discussions with Mr. Marston and

that the Biological Trials Team would approach A.M.R.E. for the provision of the necessary electronic equipment to Mr. Marston's Laboratory. An endeavour would also be made to arrange for a visit, lasting perhaps a week, by an electronic expert whose advice Mr. Marston would appreciate in a number of matters.

9. The writer desires to record his great indebtedness to those who assisted in the discussions here reported, especially to <sup>and Mr. Hedley Marston</sup> Dr. White of the C.S.I.R.O. <sup>Professor Chad</sup> and to the Department of Supply. The rather congested programme could be followed only because Messrs. W. O'Connor and J.H. Allen of the Department of Supply and the Department's security officers in Melbourne, Adelaide and Sydney devoted considerable effort to making the necessary arrangements.

Professor G.M. Evans, Sydney, will advise on certain aspects of the provision of small animals.

The duties of the two members of the Trials Team will be as follows:-

(a) To take charge of experimental <sup>Salisbury</sup> R. Scott Russell  
Department of Agriculture  
University of Oxford

(c) To collaborate in the collection of native fauna.

(d) To transmit, as soon as possible, to the United Kingdom, comments on the provisional programme in so far as it affects the above.

Mr. A. Packham will be responsible for procuring supplies and for making any other arrangements necessary in Australia. The Superintendent, W.S.E., Salisbury, Mr. F.P. O'Grady, has been authorized by the Department of Supply to meet the Team's requirements and Mr. Packham will work in close association with Mr. O'Grady's office.

The principal services desired from the Department of Supply have been discussed in general outline with the Controller, W.S.E. and with Mr. F.P. O'Grady and no difficulties are anticipated.

As at present agreed the items to be arranged by Mr. Packham are:-

Appendix I

PROPOSED PLANS AUSTRALIAN COLLABORATION  
IN ANIMAL INVESTIGATIONS

1. It has been agreed that the following members of the C.S.I.R.O. Division of Biochemistry and General Nutrition will assist:-

H.R. Marston, F.R.S., Chief of Division, to give general advice.  
A. Packham, B.Sc., Technical Secretary, to be in charge of Australian organisation.  
I.G. Jarrett, M.Sc., Physiologist (P.R.O.)  
B.J. Potter, M.Sc., " (R.O.)

The two latter will be members of the Trials Team

It is hoped that Mr. Packham can be spared from Adelaide to join the team for a period of up to one week.

Professor G.W. Emmens, Sydney, will advise on certain aspects of the provision of small animals.

2. The duties of the two members of the Trials Team will be as follows:-

- (a) To take charge of experimental animals from their despatch from Salisbury.
- (b) To conduct experiments on sheep in collaboration with British members of the Team.
- (c) To collaborate in the collection of native fauna.
- (d) To transmit, as soon as possible, to the United Kingdom, comments on the provisional programme in so far as it affects the above.

3. Mr. A. Packham will be responsible for procuring supplies and for making any other arrangements necessary in Australia. The Superintendent, W.R.E., Salisbury, Mr. F.P. O'Grady, has been authorised by the Department of Supply to meet the Team's requirements and Mr. Packham will work in close association with Mr. O'Grady's office.

The principal services desired from the Department of Supply have been discussed in general outline with the Controller, W.R.E. and with Mr. F.P. O'Grady and no difficulties are anticipated.

4. As at present agreed the items to be arranged by Mr. Packham are:-

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- (a) Metabolism pens: 5 pens for wethers  
3 pens for ewes

Designs will be modified from standard pattern of C.S.I.R.O. Division of Biochemistry and General Nutrition in conjunction with W.R.E.

(b) Animals:

Sheep - as specified by C.S.I.R.O. Division of B. and G.N.

Mice - 500

Rabbits - 160

Goats - 30

Details will be supplied from U.K. on desired age, weight, colour, and type of animals other than sheep, and Professor G.W. Emmens, Sydney, will collaborate in their selection in Australian Facilities for holding goats will be provided at W.R.E.; the other animals will be held by C.S.I.R.O., Division of Biochemistry and General Nutrition prior to despatch.

(c) Feeding Stuffs:

(i) Rations available in S. Australia for mice and rabbits together with rations available through Professor Emmens will be reported to U.K. by Mr. Packham.

(ii) Rations for sheep for 6 weeks and for goats for 4 weeks will be provided.

(d) Transit cages and pens:

Mice - 30 cages 12 x 6 x 6 in. (8 animals each)

Rabbits - 160 cages 18 x 10 x 15 in. (1 animal each)

Sheep and Goats - as specified by C.S.I.R.O., Division of B. and G.N.

(e) Special Exposure cages:

On receipt of details Mr. Packham will investigate Australian supply with the advice of Professor Emmens.

(f) 2 rifles and 2 shotguns plus ammunition for collection of local animals.

(g) 100 gin traps plus 500 numbered ear-tags.

(h) Typewriter, electric calculating machine, and moderate power microscope to be obtained on loan if possible.

(i) Consult C.S.I.R.O. on obtaining vivisection licenses for British members of Biological Team.

(j) Consult W.R.F. regarding fire-arms licenses for 1 rifle and 1 shot gun to be brought from U.K.

- (k) In conjunction with W.R.E. to supervise the arrival and onward despatch of Biological Team stores from U.K.
- (1) Supervise supply of the following items detailed in programme for provision of herbage boxes (Appendix II):-
  - (i) Provision of 2500 plant boxes and planting of herbage.
  - (ii) Artificial rain equipment
  - (iii) Shelter.
- 5. Literature on subjects relevant to the biological work of the Team to be sent to the Australian members from U.K.
- 6. It was considered desirable that prior to the assembly of the Team at Maralinga Dr. Barnes, the M.R.C. physiologist in the Team, should visit the C.S.I.R.O. Division of Biochemistry and General Nutrition for perhaps two weeks so that fuller discussions could be held between him and the Australian members of the Team.
- 7. By arrangement with Mr. W. Worth, Chief Security Officer, Department of Supply, the Regional Security Officer, Department of Supply W. Australia, will provide all necessary advice and organise for mail to be forwarded by safe hand via A.S.L.O., London.
- 8. 10 empty boxes will be provided to C.S.I.R.O. Division of Biochemistry and General Nutrition for preliminary experiments.
- 9. Sufficient wire netting will be provided to screen 200 boxes in the house which is situated at 200 ft x 4 ft, wide of 1 inch mesh. 200 yards fine wire will be required for securing.
- 10. A simple device for giving artificial rain-fall will be devised.
- 11. A movable shelter consisting of scaffold poles and canvas approximately 20 x 20 ft, or suitable alternative, will be provided for working on boxes at Maralinga.
- 12. The Regional Security Officer, Department of Supply, W. Australia, will supervise and advise on Security. Apart from Professor Donald Woods at Waite Research Institute responsible for procurement of soil will be informed only that it is used by W.R.E. Salisbury.
- 13. In conjunction with the Health Physics

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Appendix II

PROPOSED PLANS FOR PROVISION OF HERBAGE BOXES

1. Professor J.G. Wood, Professor of Botany, University of Adelaide and Professor C.D. Donald, Professor of Agriculture, University of Adelaide, (Waite Research Institute) have agreed to advise. Mr. Packham will be in charge of administrative aspects.
2. 250 cordite boxes modified as specified will be prepared at W.R.E., Salisbury. Six carrying stretchers for boxes will be provided.
3. A compost/loam mixture sufficient to fill 240 boxes will be prepared under Professor Donald's direction at Waite Research Institute. Mr. Packham will arrange for transport, and repayment of labour and material costs through W.R.E. Salisbury.
4. 240 boxes will be planted at W.R.E. in a rabbit-proof enclosure preferably in November 1955. 120 boxes will contain perennial rye grass and 120 boxes a perennial rye grass/clover mixture.
5. 10 empty boxes will be provided to C.S.I.R.O. Division of Biochemistry and General Nutrition for preliminary experiments.
6. Sufficient wire netting will be provided to screen 200 boxes in the field: this is estimated at 500 ft x 4 ft. wide of 1 inch mesh. 600 yards fine wire will be required for securing.
7. A simple device for giving artificial rain-fall will be devised.
8. A movable shelter consisting of scaffold poles and canvas approximately 10 x 10 ft, or suitable alternative, will be provided for working on boxes at Maralinga.
9. The Regional Security Officer, Department of Supply, South Australia, will supervise and advise on Security. Apart from Professor Donald those at Waite Research Institute responsible for procurement of soil will be informed only that it is to be used by W.R.E. Salisbury.



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Appendix III

Proposed plans for collaboration by members of Division of Land Research and Regional Survey, C.S.I.R.O.

1. It has been agreed that Mr. G.S. Christian, Chief, Division of Land Research and Regional Survey, C.S.I.R.O. will find a member (or 2 members) for the team and will supervise a preliminary vegetational survey in the zone up to 100 miles distant from ground zero.
2. The object of the vegetation survey is to enable sites to be selected at which the deposition of fall-out can be correlated with (a) the contamination of herbage of types consumed by grazing animals in the arid parts of Australia (b) the absorption of fission products from the soil by ephemeral herbage can be studied in subsequent seasons if suitable arrangements can be made.
3. As a first step Mr. Christian will carry out a preliminary reconnaissance by air. This will be arranged through W.R.E. Salisbury by Mr. J. Aitken, Department of Supply, Melbourne.  
It is hoped that a preliminary report will be available by the end of 1955.
4. Final plans for future action cannot be decided until the results of preliminary reconnaissance are known. It is hoped however that the exposure of sticky paper for fall-out collection and, the collection of herbage, can be undertaken by at least one mobile unit in close coordination with the Health Physics

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Organisation.

5. The collaboration of the Division of Land Research and Regional Survey holds promise of a far more satisfactory organisation for the collection of herbage samples than was originally envisaged. It is hoped that the work can be carried out by mobile teams not based on Maralinga. It is particularly desirable that this arrangement can be approved since the survey should provide direct evidence regarding the fraction of the fall-out deposited on herbage to which grazing sheep would consume.

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Appendix IV

Australian Service Requirements

A. Australian Army

Discussions with Major Gene al W.D. Refstago, O.B.E., D.G., M.S. and Mr. R. Plundon Scientific Advisor to Military Board Australian Military Forces led to the following conclusions regarding tasks proposed by Australia.

1. Exposure of Ration Packs:- (items 1(b), 2 and 3 of Australian list). It was noted that U.K. Service Departments had not proposed corresponding items but that the Ministry of Agriculture, Fisheries and Food's programme would cover much of the proposed ground regarding neutron induced activity. An endeavour would be made by A.M.S. to obtain further information from British sources. Pending its receipt the possibility would be borne in mind that rations could be exposed in the containers provided to hold Ministry of Agriculture, Fisheries and Food tins. It was realised that no detailed radio-chemical analyses could be made by the Biological Trials Team.

2. Blood transfusion equipment:- (item 4 of Australian list)

It was noted that this proposal contrasted with U.K. plans in that liquid serum is used by Australian Medical Services ~~in contrast to~~ <sup>whereas</sup> dried plasma <sup>is used</sup> in U.K. services. It was considered desirable that both materials be exposed together and it was arranged that Australian services will provide details of items they wish to include.

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2. Medical supplies:- (items 5 - 8 of Australian list) It was realized that the programme of exposing a number of types of Medical and Surgical Pannier was unduly complicated in view of U.K. proposals. At the same time the comparison of U.K. and Australian panniers which contrast in structure was desirable. Australian services would therefore suggest a composite pannier to be exposed beside British Panniers. 6 such panniers would be required.

4. Burns packs:- As these are to be introduced into Australian services the results of exposing them will be awaited with particular interest.

5. The D.G.M.S. Australian M.A. expressed satisfaction that ground contamination in relation to food production was under investigation.

#### B. Royal Australian Air Force

Proposals were discussed with Ft.Lt. Thirkelsen, T.D.

1. Exposure of ration packs:- (item 1(a) of Australian list)

After discussion this proposal was withdrawn.

It is to be noted that the R.A.A.F. and Army ration packs are similar. The latter are referred to in para A 1 above.

2. Medical supplies:- (items 9 and 10 of Australian list)

Withdrawn in view of British programme.

3. Spray, insecticidal powder:- (item 11 of Australian list)

This equipment, 18 x 12 x 14" and weighing 70 lbs. approx, is of vital importance in malarial regions. Information on its survival of blast, etc. is desired. It was agreed that details would be supplied to U.K. so that the main manner of gaining information could be considered.

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4. Water filter: - (Item 12 of Australian list) consists of a covered metal drum enclosing felt pads. The objects of the proposal were to ascertain if neutron or gamma irradiation would injure pads at distances at which blast injury did not cause damage to drum, i.e. at approx 1,800 yds. from ground zero with nominal bomb. It was explained that no reduction of efficiency of filter pads was to be expected under these circumstances and that a definite statement on this question would be supplied. With this assurance it was agreed to drop the proposals.

ATOMIC BOMB TESTS IN AUSTRALIA 1952

The British and Australian Governments have agreed that investigation of biological effects of atomic weapons shall be carried out during the trials at Maralinga in 1956. The possible effects of the ingestion of radio-active fallout by man and animals will be among the subjects studied. The work is sponsored by the Medical and Agricultural Research Councils, Service Departments, the Home Office, and the Ministry of Agriculture, Fisheries and Food of the United Kingdom, in close collaboration with the Commonwealth Scientific and Industrial Research Organisation and Universities. The investigations are being undertaken for the purpose of devising more effective methods for the protection of the population, and of agricultural production, in the event of nuclear warfare.

Some of the information obtained will also be of considerable value in relation to the peaceful uses of nuclear energy. Although effective precautions have already been developed to avoid hazards in nuclear power reactors in the United Kingdom and in other countries, the probability that nuclear power stations will be widely used in the future makes it obvious that an opportunity should be lost for obtaining information on the effects of radioactive contamination. Atomic bomb tests provide a unique opportunity for studying some aspects of this subject.

Sheep and small animals will be used in part of the biological work at Maralinga. The conditions to which the animals will be subjected are similar to those of normal laboratory experimentation in Medical and Biological establishments. Elaborate arrangements for the welfare of the animals are being made and for scientists who will be in charge of them have wide experience of work of this type in the United Kingdom and in Australia.

1. Before release statement must be referred to U.K.
2. U.K. attention should be directed to the fact that for public relations reasons, the Medical and Agricultural interests have been specially stressed.

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Appendix V

Draft proposed with Safety Committee for use if and  
when a public statement is decided upon by the appropriate authorities.

BIOLOGICAL INVESTIGATIONS AT  
ATOMIC BOMB TESTS IN AUSTRALIA 1956

The British and Australian Governments have agreed that investigation of biological effects of atomic weapons shall be carried out during the trials at Maralinga in 1956. The possible effects of the ingestion of radio-active fallout by man and animals will be among the subjects studied. The work is sponsored by the Medical and Agricultural Research Councils, Service Departments, the Home Office, and the Ministry of Agriculture, Fisheries and Food of the United Kingdom, in close collaboration with the Commonwealth Scientific and Industrial Research Organisation and Universities. The investigations are being undertaken for the purpose of devising more effective methods for the protection of the population, and of agricultural production, in the event of nuclear warfare.

Some of the information obtained will also be of considerable value in relation to the peaceful uses of nuclear energy. Although effective precautions have already been developed to avoid hazards in nuclear power reactors in the United Kingdom and in other countries, the probability that nuclear power stations will be widely used in the future makes it obvious that no opportunity should be lost for obtaining information on the effects of radioactive contamination. Atomic bomb trials provide a unique opportunity for studying some aspects of this subject.

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Notes:

1. Before release statement must be referred to U.K.
2. U.K. attention should be directed to the fact that for public relations reasons, the Medical and Agricultural interests have been specially stressed.