File 702080

C. W. Shilling, M.D., Deputy Director
Division of Biology and Medicine

July 15, 1958

Paul S. Henshaw, Biophysicist
Medical Research Branch, DBM

ADVISORY COMMITTEES FOR HUMAN RADIOBIOLOGY AS A SUBDIVISION UNDER PROGRAMMATIC CATEGORY "WHOLE BODY IRRADIATION SYNDROMES"

Symbol: DBM:PSH

On April 14, a memorandum "Development of the Programmatic Category — Human Radiobiology" was sent to you which outlined certain preliminary thoughts on the subject. Since that time, two steps have been taken the consequence of which I feel make it feasible to recommend formation and use of Advisory Committees for the new category — that is, through our AIBS facility.

Step 1. Following suggestions, mainly by Dr. Brunar, I attended the annual program review, June 24-25, of the dog studies under way at the University of Utah and raised question informally with the "Founding Fathers" group (which serves as an advisory committee on the dog project): (1) whether the committee would agree that benefit to research in the field would derive from centralized attention to the "ready-made" experiments in human radiobiology, and (2) whether the "Founding Fathers" group might be willing to serve as an advisory committee on plans and procedures developed within the DBM by a programmatic group on Human Radiobiology. Only two members of the Founding Fathers group, Dr. Robley Evans and Dr. Wright Langham (other members being Shields Warren, Austin Brues and Harry Blair), were present at the Utah meeting, but both agreed quite readily on the two points.

Step 2. Consideration has been given to the contract proposal presented by Alexander Langer which outlines an approach for appraising the effects of environmental radiation on total health (general fitness) of human population groups; epidemiological data coming from public health statistics and from various exposed populations would be used. The proposal outlined plans for use of an interdisciplinary model or formulation designed to enable evaluation of environmental radiation in relation to various other central determinants of total health. Because of timeliness of the proposal, because of the importance of the problem in relation to areas of AEC responsibility, and because there were questions about Dr. Langer's proposal, he was invited to come in for a conversation. This took place June 30 and those who participated were Drs. Shilling, Zelle, Totter, Bonnar, Liverman and Henshaw, and the deliberations seemed to crystallize ideas to some extent.

DBM:PSH
Henshaw/amk
7-15-58

O+M-6 Effects of Env. Rad. on Human Being
Cys for O+M-7 H

Whereas treatment of Part I would necessitate integration of pathologic and physiologic aspects, treatment of Part II would require integration of epidemiologic, gerontologic, and demographic aspects, thus making a separate committee for Part II seem advisable. Part II is, in reality, a new field area and one which offers the prospect of determining whether low level environmental, beneficial or detrimental for the human species and how much. A methodological approach is emerging and it appears that there soon will be contract proposals outlining plans for use of human data from a variety of sources in such a way as to enable preliminary appraisal of the general effects of environmental radiation on population groups. It is felt that a separate committee of two or three people with qualifications different from those for the committee associated with Part I should be formed or used as consultants, and that each group should be kept informed of the other's work. The idea would be, then, that the document when developed would deal with both Part I and Part II aspects.

Summarizing, it is proposed:

1. That the "Founding Fathers" group be asked to serve as an advisory group on Part I aspects.

2. That a new and quite small advisory group be formed to assist in dealing with Part II aspects.

3. That, in accord with your general suggestion, an NIH representative be invited to participate as an advisor on planning and as a consultant to the committees for both Part I and Part II.

4. That, also in accord with your suggestion, arrangements be made through the AIBS as the need may arise for writing assistance.

5. That the monograph approach be utilized as the main means of crystallizing views about administrative management of research in the field of human radiobiology.

Attachment
Ready-Made Experiments in Human Radiobiology

2. Data Coordination Center - In order to insure the opportunity for long-range use of raw data and research materials pertaining to large animals and human beings, there is need for some kind of data coordination facility -- possibly for one which would not only draw together and systematically store materials, but also perform research on such materials. Conceivably, problems could be investigated by utilizing the amassed materials that could not be investigated at the location of any one source of such materials. For this purpose, consideration could be given to centers such as the Argonne National Laboratory, the Armed Forces Institute of Pathology (Walter Reed Hospital) or the AEC Health and Safety Laboratory, New York; consideration could also be given to a role that could be performed by a unit within the DBM, possibly in combination with one or another of the other locations.

3. Urgency - Opportunities to make observations and measurements of radiobiologic effects in human beings are rare. It would therefore seem necessary to take the point of view that no effort should be spared in taking advantage of opportunities that exist. In the same way that stimulus and benefit are likely to derive from some centralized development and codification of information about irradiation effects at the tissues and organ-system level in larger organisms, so also are stimulus and benefit likely to derive from some centralized development and codification of epidemiological information.

IV. Proposal:

It is proposed that two advisory committees (names to be developed) be formed in accord with the thoughts expressed.

Ready-Made Experiments in Human Radiobiology

1. Japanese at Hiroshima and Nagasaki
2. Japanese fishermen
3. Marshallese
4. Accident cases (United States and elsewhere)
5. Radium dial painters (United States)
6. Drinkers of radioactive water (United States)
7. Inhabitants of monosite sands (India, Brazil, and other)
8. Miners (Belgian Congo, Yugoslavia)
9. AEC and other workers in the atomic industry
10. Therapy cases

Schizophrenics in the Chicago area given radium salts.
Arthritics in the Chicago area given radium salts.
Patients at the University of Chicago given heavy X-ray treatments for gastric and duodenal ulcers.
Patients in the Boston area treated with radioiodine.
Children in the Baltimore area receiving radium treatments to the Eustachian orifice.
Children in different parts of the United States receiving X-ray treatments to the thymus.
Patients given thorotrast for visualization of the vascular tree.
Fetal fluoroscopy cases.
Cancer therapy cases (of many types)
Ankylosing spondylitis cases in England

Dr. Charles W. Shilling, Deputy Director
Division of Biology and Medicine

April 14, 1958

Paul S. Henshaw, Biophysicist
Medical Research Branch, DBM

DEVELOPMENT OF THE PROGRAMMATIC CATEGORY - HUMAN RADIOBIOLOGY

Symbol: DBM:PSH

In response to your memorandum of April 7, and especially the idea that benefit will derive from bringing together in one place, and analyzing to the extent possible, the accumulating data from "ready-made human experiments," the task is visualized as consisting of two parts:

Part I: That which deals with higher dose effects - the clear-cut observable modifications, such as: sickness, progenitive tissue loss, burns, sterility, cataracts, neoplasia and death.

Part II: That which deals with lower dose effects - modifications such as reduced fitness, earlier senescence, life shortening, and reduced population vigor, resulting in particular from lower level protracted irradiation.

Reports are available and data are accumulating in relation to some 15 or 20 ready-made human experiments throughout the world. The idea would be to draw information from all of these, as can be done, organizing it according to effects such as identified above, thus strengthening as much as possible the impressions of radiobiologic action in human beings. In simplest form, this would probably mean a monograph or systematic documentation that could be revised from time to time as information continues to accumulate.

As key interest person for the programmatic category - human radiobiology, I can take the initiative and develop subject matter headings for a document and identify some of the sources of data that would have a bearing in each case and some of the writers qualified to handle subject materials. At this stage then the development would benefit greatly from committee attention.

After talking at length with Dr. Bruner on these matters, we agreed that the so-called "Founding Fathers" group (S. Warren, A. Brues, Robley Evans, W. Langham, and H. Blair) would be especially suitable to give advice relative to the Part I phase — first, because this committee has dealt previously with related problems, and second, because essentially the same people would most likely be the ones selected if a completely new committee were to be formed.

Medical

PSHenshaw:amk

4-14-58

After the conversation with Dr. Langer, views appeared to be as follows: (1) that dealing with total health of population groups involved features of public health, human ecology, conservation, and demography, among others; but that because of the central significance of radiation as a factor which influences somatic as well as genetic quality and thereby the population group stamina and resiliency, it would be appropriate and desirable that the AEC-DBM exercise some research initiative in the field; (2) that whereas total health can properly be regarded as an aspect of human radiobiology along with studies of prompt and late effects on tissues and organ systems, dealing with the two aspects would require different disciplinary specialization so far as advisory committees would be concerned; (3) that any attempt to deal with the relationship of radiation to total health should have support of a committee with the highest possible scientific competence and prestige; (4) that the Langer proposal points up the need for an advisory committee different from the Founding Fathers group; and (5) that with banking of a suitable committee (shall we say: Founding Mothers group for purposes of identification — and since considerable gestation would be needed), work on radiation and general fitness could be initiated which would be valuable and important so far as AEC objectives are concerned.

On the basis of ideas expressed here, it is suggested that two advisory committees on Human Radiobiology be formed — one to consist of the Founding Fathers group (providing our proposal is acceptable to them), and the other to consist of people such as the following:

Paul B. Sears, Conservation, Yale University
George Beadle, Genetics, California Institute of Technology
Stanley A. Cain, Conservation, University of Michigan
George Darling, Human Ecology, ABCC
Irene Taeuber, Demography, Ofc. of Population Research, Princeton Univ.
Harold Dorn, Biostatistics, NIH
Alexander Langer, Pathology, Harlem Hospital
Ewald W. Busse, Psychology, Duke University
Thomas Francis, Pathology, University of Michigan

If the idea of committees is approved, it is proposed that informational material such as the attached statement be sent to prospective committee members, and, after satisfactory response to preliminary inquiry, that invitations for membership and participation be issued through the AIBS.

Attachment
"Human Radiobiology"

cc: Dr. Brunar

HUMAN RADIOBIOLOGY

I. The Problem:

To delineate plans for obtaining greater and more meaningful returns from the various "ready-made" radiobiologic experiments involving human beings — also from the various experiments with larger animals that have a direct bearing on studies of the human reactions.

Specifically, to outline ideas and justification for establishment and utilization of two DBM advisory committees on Human Radiobiology.

II. Background:

1. Features of the Problem - Increasingly, there is demand for information about the effects of radiation on general health and well-being, both of individual human beings and of population groups. In particular, there is demand for information about the effects of environmental radiation on fitness and longevity, taking into account the combined effects of changes induced in the germplasm and the somatoplasm. Beyond this, there is a demand for information about the relative significance of environmental radiation as one of the central determinants of total health.

There is the possibility that if the accumulated animal results are analyzed more completely, that if fuller use is made of the "ready-made" human experiments, and that if serious attention is given to development of integration analysis procedures (procedures designed to measure stamina and resiliency of whole individuals and population groups, taking into account different stress agents, including radiation), the rate of increasing our understanding of radiation effects on people can be greatly accelerated.

Research is in progress dealing with different aspects of human and large animal reactions, but it is spotty and uncoordinated. With some effort on the part of DBM to organize the available knowledge, to indicate the work in progress and the kinds of raw data available, to identify pertinent needs for information, and to stimulate new developments, there is the possibility of considerably more rapid progress. Such effort would involve staff work to develop ideas and plans, and bring to bear the views of expert committees.

2. Uniqueness of the Situation - Fitness and longevity data accumulate through long periods of time, as a rule -- especially when the test subjects are large animals or human beings; moreover, there are often sizeable accumulations of materials (tissue slides, autopsy materials, radiographic plates, laboratory findings, etc.). Because of the time elements involved, personnel and leadership tend to change, with the consequence that the "claim to authorship" (inherent in shorter term work and highly respected by scientific people) tends to be lost, and experimental materials tend to accumulate and sometimes to deteriorate or disappear. This has been especially true at Hiroshima and it is true to some extent in connection with the long range dog, primate, and mouse colony studies.

Conditions being what they are, there is opportunity -- if not a real need -- to promote a new kind of research -- one involving: first, the systematic preservation of the materials of long-range studies; second, the identification of questions that can be answered by use of the materials accumulating at different locations (materials which may not be used unless employed in a manner such as this); third, the development of opportunities to obtain data from the different sources; and fourth, arrangement for publication of results under fair and acceptable authorship.

3. Kinds of Large Animal and Human Data - The radiobiologic data pertaining to large animals and human beings, are of two general types: (1) those pertaining to morphologic and physiologic changes in cells, tissues, organs and organ systems; and (2) those which are epidemiological in character, dealing with fitness and longevity. Analysis of morphologic and physiologic results requires a type of technical specialization quite different from that essential for evaluating the determinants of general fitness of individuals and population groups, yet each specialty is needed to support the other.

III. Comments:

1. Advisory Committees - In accord with the various points made and in keeping with the practice in DBM (seeking the services of formalized advisory committees for certain programmatic areas of interest), it appears desirable to establish two advisory committees for Human Radiobiology: the first to consider and make suggestions concerning staff proposals relative to systemic changes induced by environmental radiation in large animals and human beings, and the second to deal with such relating to changes in general fitness of individuals and population groups.