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NATIONAL ACADEMY OF SCIENCES
NATIONAL RESEARCH COUNCIL

2101 CONSTITUTION AVENUE, WASHINGTON, D. C. 20418

May 26, 1965

Dr. Warren Johnson
Vice-President Special
Scientific Programs
Office of the President
The University of Chicago
Chicago 37, Illinois

REPOSITORY ARGONNE/CHICAGO FRC
COLLECTION LAB DIRECTOR'S FILES
BOX No. ACCESSION # 434-93-0012, Box 27
FOLDER ANL REVIEW COMMITTEE FOR
RADIOLOGICAL PHYSICS DIVISION
1964-1973

Dear Dr. Johnson:

Enclosed are two sets of the report made by the Review Committee of the Radiological Physics Division of the Argonne National Laboratories.

The one marked "Privileged Information" is, exactly the one that was circulated to the Review Committee for its approval. With the minor exception of the last sentence in the paragraph at the top of page 6, the committee members were unanimous in approving the report for transmission to you.

It was suggested that the sentence beginning -- "May and Lucas ..." was too broad, in that it might be read as our suggesting firing Miller because he might not be indispensable. This was not really the intent, although we did have the feeling that if these programs were somewhat readjusted --- miller's location in the re-grouping might be somewhat uncertain.

In spite of this general approval by the committee, I had some personal misgivings over the frankness of our report and the ability of a group such as ours really coming to grips with the whole problem as a result of such short visits as we are able to make. Therefore, I am enclosing a second somewhat expurgated version of our report which might be circulated more broadly as is your custom. You may have some different ideas as to how you would want to handle the two reports, but I think it is important that you understand our own belief, that we do not pretend to know how to run the organization better than those who live with it day in and day out.

As I expressed to you over the telephone the other day, we have had the feeling that the Miriam Finkel problem was somewhat out of our scope. If you feel differently about this, please let me know what you would like us to do further on this and whether you want us to examine it in any detail? If you should decide upon the latter, I have a feeling that it would be desirable to co-opt, at least one other member from the Review Committee for Dr. Zelle's Division.

Sincerely yours,

Lauriston S. Taylor
Lauriston S. Taylor

Enclosure: as above

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ARGONNE NATIONAL LABORATORY
Meeting - March 29-30, 1965

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Report by Review Committee on
Radiological Physics Division

The main purpose of the March review of the Radiological Physics Division was to examine their biologically oriented projects since this was not done at the meeting last fall. Two areas in particular were studied.

1) TOXICITY OF RADIOELEMENTS

Work in the subject area as a whole at Argonne, without consideration of Divisional responsibilities, is undertaken roughly according to the following categories:

- (a) Radioelements in the environment
- (b) Entry of radioelements into man
- (c) Metabolism and pattern of distribution of radioelements in the body
- (d) Assay of body burdens
- (e) Internal dosimetry
- (f) Biological effects of internally deposited radioelements (Gross response and mechanisms of production of harm)
- (g) Modification of body burdens

It is the opinion that these studies are closely related and that the total effort will stand to benefit if the findings, concepts, skills and experience generated by personnel in each study are known and reasonably accessible to all the other investigators. The advantages will be gained in regard to the choice of problems to be studied, the experimental design, execution, and interpretation of results.

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At the risk of being obvious a few examples are cited. The persons studying biological effects should know which radioelements are most likely to be of potential concern; this information comes from knowledge of the amounts to be encountered, the retention expected in man, and the dosimetry. Successful modification of body burdens requires knowledge of metabolism, and prevention of exposure requires knowledge of pathways of entry. If it is known that certain segments of the population are at greater risk for certain radioelements, then the studies of metabolism and effects can be more intensively directed.

Because of historical development at Argonne, the above studies are carried out under various organizational units which now have specialized capabilities. It would not be feasible nor perhaps entirely desirable to rearrange the administrative and physical allocations. However, exceptional efforts should be made to promote informal and continuing exchange of information and ideas. In addition, duplication of specialized facilities and techniques should be avoided whenever possible. For example, the Radiological Physics Division must carry on a certain amount of work with laboratory animals and dogs to confirm and extend its theoretical developments; it would seem to the advantage of all concerned that the maintenance and handling of experimental animals be provided by the experienced personnel of the Division of Biological and Medical Research. On the other hand, the latter Division may at some time require measurements of internal dosimetry, which the Radiological Physics Division would be eminently fitted to provide.

As far as could be judged the extent of present collaboration is dependent upon the initiative of the individual investigators. In some areas it is clearly excellent, in others, lacking.

It is proposed: (a) that any future administrative changes be carefully considered in regard to impact upon the cohesiveness of the scientific effort and (b) that mechanisms be developed to increase the exchange of ideas among persons in related fields of work.

The program in mineral metabolism was most impressive. The leaders of the work are both sound and imaginative. The program is being carried forward vigorously not only in answering practical questions of importance such as those dealing with radium patients, but also in successful efforts to develop models of alkaline earth metabolism that will be adequate for predictive purposes. There is agreement with the future direction of the work as described to the committee. In particular, it is hoped that studies can be carried out on the Elgin patients especially to attempt modification of the radium body burden. Before this is done, however, the problems of alkaline earth removal from the body should be explored more intensively in the laboratory than at present in order to provide guide-lines.

2) RADIUM STUDIES

The Argonne National Laboratory and the Argonne Cancer Research Hospital have in the past made important contributions to the study of radium metabolism and radium poisoning in man. Just when integrated and consolidated direction was needed, the ANL capacity to continue a strong

and creative program in this area has been weakened close to the point of destruction by fragmentation of the responsibility for various aspects of the work.

About 12 years ago the study of radium poisoning at ANL centered in the Medical Division where Norris and colleagues formulated a power-function to describe the retention of radium which they measured in the Elgin Hospital patients who had been injected with known amounts of radium in 1931 by Schlundt. This was accompanied by measurements of a few radium dial painters from the nearby town of Ottawa, Illinois.

About this time Marinelli came (initially in 1948 on leave from Memorial Hospital, New York) to the Radiological Physics Division, ANL, and began work in which he improved the sensitivity of measurement of the radium burden in living humans by introduction of the then new NaI(Tl) scintillation counter, multichannel analyzer, and a shielding enclosure which, with engineering support from John Rose, became the "iron room," "whole body counter," or controlled background facility (COBAFAC).

Charles Miller, an electronics specialist with Rose and Marinelli on the first multichannel analyzer, became enthused and conducted a vigorous and successful search for former dial painters from Ottawa. Collaboration in the medical and radiographic phases of the work was found in the smooth-working team of Dr. Robert J. Hasterlik of the Argonne Cancer Research Hospital and Dr. Asher Finkel of the ANL Health Division. In the Radiological Physics Division some breath radon work was carried out by Lucas and very important pioneering work on bone metabolism and radium was done by Rowland and Marshall using microradiographic and autoradiographic techniques.

By about 5 years ago the very effective ANL work in several aspects of the radium studies centered in the Radiological Physics Division (Marinelli, Miller, Rose, Lucas, Rowland, Marshall) with collaboration for medical and radiographic studies from the Health Division (Asher Finkel) and the Argonne Cancer Research Hospital (Hasterlik).

It is a near tragic loss to American science that this team has been broken up and its leadership clouded through personality conflicts and other factors culminating in the administrative transfer of Miller, and Marinelli's iron room facility to the Health Division, although physically the apparatus and the personnel remain as occupants of the Radiological Physics Building.

As the organization stands now, we understand that the centrally important Elgin Hospital patients have been put in Miller's hands by the ANL Director and are being restudied by Miller and Finkel using body gamma-ray measurements. Marinelli and the Radiological Physics Division would like to participate more strongly, and should, with Lucas doing radium measurements on blood samples and radon measurements on breath samples, Rowland and Marshall obtaining and studying bone samples, Holtzman studying radium D accumulation in teeth and bones, Simmons studying the effects of diet, parathyroid hormone and other drugs on radium excretion, and May and Rowland studying the dosimetry of the mastoid region in these and other subjects.

From the available evidence one can only feel that the ANL Director has erred in fragmenting this work and in transferring responsibility for it outside of the Radiological Physics Division. (The Health Division has just published a Semiannual Report, ANL-6839, January through June 1964, of 86 pages, a major portion of which is actually work done in the Radiological Physics Division by Miller and associates before his administrative transfer

to the Health Division). I believe that a strong and creative program could be restored to ANL if responsibility for the wholebody gamma-ray counting apparatus in the Radiological Physics building, built by the Radiological Physics Division, were transferred back to the Radiological Physics Division, and if primary responsibility for the entire radium-in-human program were returned to the Radiological Physics Division. May and Lucas are experienced and competent to handle body gamma-ray and breath radon measurements in case Miller became unavailable through the return of program management to the Radiological Physics Division.

FUNDAMENTAL RADIATION PHYSICS AND CHEMISTRY

This session of the Review Committee was not particularly concerned with the program on Fundamental Radiation Physics and Chemistry, but some remarks on this program are made anyhow. Among the technical operations, the successful start and early results of Dr. Person's experiment are noted. The lack of professional integration and overall direction in the management of this program are beset with serious incidental difficulties which are of great concern and difficult to remedy. The recent decision of expanding the area of responsibility of Dr. Rieke is welcomed as an initial step. The stakes in overcoming the present difficulties are so high for the Division that a major managerial effort should be directed at reestablishing meaningful communication and understanding so as to avoid further dismemberment.

METEOROLOGY

The meteorology program is going well on a more or less routine basis. Dr. Frenzen's interests are continuing to expand in a most commendable manner.

The response of Mid-Western Universities to the proposed wind tunnel modelling facility is most heartening. It appears that the administration now feels that this facility will be sufficiently used by the neighboring academic community to warrant including the proposal in some future budgeting.

STAFFING

It was noted that there have been essentially no staff changes, at least since our last meeting. Having previously noted that, there were some plans for staff improvement we inquired as to the cause of this, ie: according to plan, funding, availability of people, etc.. It was pointed out that the primary reason for the static condition was the lack of funding.

There have been some small decreases in the Division's operating funds. We appreciate that this is in line with present governmental trends, but when you are trying to regroup an organization where a large fraction of its budget is to cover fixed charges, most of the Director's elbow-room disappears with even a small budget cut.

During discussions of budget we were puzzled by the fact that the Division Director was never quite certain whether his totals included charges only for his Division, or that of the Finkel program also. It seems an unnecessary annoyance to have budgets for a program being run out of the office of the Laboratory Director show up in one of the Divisions.

The Committee shares the Director's concern for the poor ratio of technicians to the professional staff. The present ratio is 0.86 for the Division as a whole. The Meteorological portion of their staff has a ratio of more than 1. If this group is not counted, the ratio for the rest of the Division is 0.75 which is very low indeed.

It is strongly recommended that active steps be taken to support the Director's plans to increase the technician support in the Division. This seems to be particularly urgent when one realizes that one of the leading scientists has no assistant.

The work, down to program levels, is adversely affected by a variety of management problems. It appears that this Division (and the Division of Biological and Medical Research) seem to have more than the normal number of personality conflicts and adjustment problems. (It is recognized that in almost any group of more than a few people, there would likely be such problems). In fairness to the Directors of these two Divisions - where some of the problems are interrelated - it could be pointed out that they have inherited some of their more severe personnel problems and we feel that it is about time they were given some relief.

We appreciate that this is a matter of internal management, which is not really our concern. On the other hand these personnel situations all adversely affect the technical programs whether directly, through having to make program adjustments, or indirectly by unnecessarily taking up the Directors' time and energy.

The following attended the meeting:

W. Armstrong
C. Comar

B. Davidson
R. Evans
T. Evans

U. Fano
L. Taylor