OAK RIDGE NATIONAL LABORATORY
OPERATED BY
CARBIDE AND CARBON CHEMICALS COMPANY
A DIVISION OF UNION CARBIDE AND CARBON CORPORATION
UCC
POST OFFICE BOX P
OAK RIDGE, TENN.

March 2, 1953

363

Airmail

Dr. John C. Bugher, Director
Division of Biology and Medicine
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Dr. Bugher:

I am sure there are a number of items that should be discussed at the Tri-Partite Conference which occur to everyone invited, so I will not bother to list these. However, there are a few items which may not be so obvious, which I will list as follows:

1. I have prepared a rough draft of the report of the International Subcommittee on Internal Dose. It is quite similar to the National (U. S.) Committee on Radiation Protection Internal Dose report, which has been submitted to Dr. L. S. Taylor and is now in the hands of the publishers to be issued as National Bureau of Standards Handbook 52. I believe I can have this preliminary International Internal Dose report ready in rough draft form for consideration at the meeting if so desired.

2. I believe it would be wise to consider modification of some of the weights of the "standard man," especially the weights of the light organs, for example, the weights of the thyroid, teeth, prostate and adrenal were rounded off at 20 grams each, whereas the best data we have seems to indicate better values would have been 15, 23, 16 and 14 grams each. Rounding off of the weights of the heavy organs in general was not as serious because the per cent error introduced was less. For example, the weights of the blood, GI tract, brain, lungs and spleen were rounded off at 5,000; 2,000; 1,500; 1,000 and 150 instead of more accuate values, which probably should have been 5,400; 2,300; 1,400; 950 and 200, respectively. Also the weight of fat in the standard man was not given and this is needed in the calculations.

3. Perhaps it is not considered appropriate to concern this group with the definition of units, but since units are used in all of the handbooks under preparation by Subcommittees of this international group, it is rather important that one unit in particular, the rep, be given some consideration at this time. In NBS Handbook 42 and a number of other publications, it has been defined as "the absorption of ionizing radiation energy in tissue of 93 ergs/gm." Recently one of the subcommittees of the National Committee on

Radiation Protection prepared a report entitled "Personnel Protection for Betatron-Synchrotron Radiations Up to 100 Million Electron Volts," and they are suggesting a definition which would be 93 ergs/gm of medium irrespective of the medium. I have no strong feeling for either definition, but would like to know which to use in the preparation of the handbooks. I have a slight personal preference to define the rep in terms of 93 ergs/gm of tissue since this is intended to be a biological unit related to the roentgen, and where other media are involved I think only ergs/gm should be used and related to the rep by the conversion constant which is the ratio of the mass stopping power in the medium to the mass stopping power in tissue.

4. Chemical Composition of the Body Organs of the Standard Man.

This was an item of unfinished business at the Chalk River Conference. There is some information on the average chemical composition of the total body, but there is much contradiction in the published literature even in this case. One such set of data was given in the Chalk River report, but Dr. Shields Warren, who was chairman, requested that Cipriani of Canada, Mitchell of Great Britain, and Morgan of the United States serve as a group to try to collect information leading to the best choice of values for the chemical composition not only for the total body but also for the individual organs of the standard man. This data is very essential to the Internal Dose subcommittees because under equilibrium conditions one would expect radio-isotopes of a given element to behave similar to the stable forms of the same element. I doubt if any encouraging new contributions can be added to the data, however, Dr. Isabel H. Tipton, who has a subcontract with our Laboratory, is making a spectrographic study of the element distribution in the body organs, but her study is far from complete at the present moment. However, I might give some of her preliminary findings if so desired.

At your earliest convenience I would appreciate knowing at what time on Monday, March 30 the Conference begins and when it is anticipated it will conclude on Wednesday, April 1. Also I would like to know where in Washington the meetings will be held.

Sincerely,

Karl Z. Morgan, Director
Health Physics Division

KZM:mof