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AN APPLICATION FOR FUNDS FOR CONSTRUCTION OF SCINTILLATION COUNTERS TO ACCOMMODATE

(1) The Entire Human Being

(2) Small Animals

SUPPLEMENT

REPOSITORY Oak Ridge Operations
Record Holding Area
Documents 1994-1994
H-86-1 Bldg. 3714 H
Cont. No. AT (40-1) 0081
Univ. of Arkansas

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INTRODUCTION:

At the time the primary application for funds for construction of a whole body counter at the University of Arkansas Medical Center was submitted, the applicant's experience had been restricted to a 4 pi liquid scintillator type of instrument. Since that time it has been pointed out that the crystal spectrometer type has several advantages. This supplement is being written, therefore, to revise the application to this extent.

RESEARCH PROJECTS:

Of the projects to be carried out when instrumentation is available, the first one listed (A-1-a) is concerned with the characterization of the instrument. It is felt that information on resolution, sensitivity, efficiency, reproducibility, etc. is necessary for determining the significance of data obtained under experimental conditions. This effort is considered to be of the same magnitude as that required with any instrument before it is used in routine accumulation of data. We do not ignore the possibility of learning some purely technological facts which may be of use to us and to others using such instrumentation.

With the crystal spectrometer, the project to study radial section activity of humans (A-1-b) is neither practical nor necessary. The principles of collimation of mobile crystals scanners have been worked out well enough to make possible local organ counting for comparison with whole body counting on the same living subject.

The study of body activity of people (A-1-c) would be a continuing project on a long term basis. Although the results would serve as normal base-line controls for other projects, particular emphasis would be placed on an analysis of the residents of the Hot Springs area (see original). The whole body activity of these people should be quantitated over as much of the isotope spectrum as the resolution of the instrumentation permits. These counts can then be deducted from those induced by experimental procdures, a "blank" as it were.

The studies on $^{137}Cs/^{40}K$ ratios of persons (A-1-d) are purely secondary and the data should accrue incidental to the studies mentioned above. Also personnel monitoring (A-1-e) is purely incidental, and may have no advantages over existing methods. Neither of these studies would be expected to yield information of fundamental importance.

The use of the instrument for screening people exposed to neutron irradiation may never come about. The applicants understand that use of the instrument might be requested for emergency purposes of a general welfare nature, and the existing projects held in abeyance.

The projects related to the activity of the reticuloendothelial system of people (A-2) need little additional comment. A detector of adquate resolution for discriminations between isotopes is highly desirable.

A number of studies using small animals (B-1 to 5) was projected in the application. It was anticipated to place this instrument adjoining our present

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animal quarters. This seemed adisable to avoid crossing patient and animal traffic in an area designed for patient care where the large detector would be housed. Such a division of labor is no longer necessary, because a new research building will be begun in January. It will be possible to locate a singel counter accessible to both types of subjects without crossing traffic. Also most of these small animal projects will be facilitated by instrumentation giving maximal resolution and discrimination.

CHOICE OF INSTRUMENT:

On the basis of more recent information, it seems advisable to consider a controlled low-background facility of the crystal spectrometer type. In addition to other advantages, these are reputed to be less expensive. Recent developments here make it possible to request only one counter, to be used both for humans and animals. This would reduce again the cost for instrumentation needed for the projects planned.

The applicants are primarily interested in obtaining information on the research problems outlined, and only secondarily interested in instrumentation.

A visit by ammember of the Research Committee considering this application, or a delegate thereof, would be most welcome.

1039407

November 30, 1959

CSMM:JTB

Dr. F. Douglas Lawrason
Provost and Dean
University of Arkansas
Medical Center
Little Rock, Arkansas

Dear Dr. Lawrason:

This is in response to your letter of November 21, 1959 and it confirms and supplements the information given to you in our telephone conversation of November 27, 1959 regarding priority assistance for the procurement of steel.

As soon as a contract to cover funds for the whole body counter project has been formalized between the University of Arkansas and the Atomic Energy Commission (AEC), we will authorize the Oak Ridge Operations Office to make the University an allotment of carbon steel in sufficient quantity to meet the requirements for the shielding room. This allotment and accompanying authority will permit you to place an Authorized Controlled Material (ACM) Order with any producer of the necessary steel plate and assure preferential treatment for this order under the Defense Materials System. It should be noted that, considering the time that will necessarily elapse before the ACM Order can be placed, delivery by January 1, 1960 is virtually impossible. Only two or three mills in this country can roll 3" plates and they already have accepted a large volume of ACM orders for December 1959 shipment.

Regarding radioactivity, new steel produced over the next several months may be made with a maximum percentage of scrap in order to conserve pig iron from the limited amount of iron ore now available.

For shielding uses similar to the University's requirement, we have been able previously to secure old armor plate from Navy excess for a number of AEC applications, without reimbursement. Such plate is generally preferred because of its so-called "low background." The Philadelphia Naval Shipyard has on hand five plates 3" thick by 6'9" wide by 19'3" minimum length and we have requested the Navy to

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temporarily earmark this material for the University of Arkansas pending arrangements for an on-site inspection by the University's representatives to determine its adaptability to the counter project. Such inspection is recommended in all our AEC applications to assure that the material offered is usefully adaptable and in this case we feel also there may be other excess material at Philadelphia that might be preferred for the University of Arkansas needs. If any of the material at Philadelphia is usable, the only cost will be handling and cutting, if any, which can be performed at the Shipyard, and freight to Little Rock.

If the University of Arkansas concurs in this inspection, we should be informed of the date selected and the name or names of the University's representatives in order that we may secure Navy Department authority for the visit and for any further negotiations by the University's representatives at Philadelphia Naval Shipyard that might be desirable.

Arrangements for action on this plate by the Shipyard and for actual shipment, if desired, must await the completion of a formal contract for the whole body counter between the University and the AEC.

Please advise, as quickly as possible, whether you wish us to make arrangements for inspection of the armor plate at Philadelphia.

Sincerely yours,

J. T. Bray, Chief
Mobilization Planning Branch
Division of Construction and
Supply

cc: Horace Marvin, M.D.
Head, Dept. of Anatomy
University of Arkansas
Dr. Bonner, B&M
C. R. Lee
R. Donovan
Ben Finuff, OROO

CSMM CSMA B&M OGC

BRAY:mfs

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AN APPLICATION FOR FUNDS

FOR CONSTRUCTION

of

SCINTILLATION COUNTERS

TO ACCOMMODATE

(1) The Entire Human Being

(2) Small Animals

by

David M. Gould, M.D. and Norman H. Marvin, Ph.D.

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