ARM1.941209.188

MEMO ROUTING SLIP

NEVER USE FOR APPROVALS, DISAPPROVALS, CONCURRENCES, OR SIMILAR ACTIONS

1 NAME OR TITLE: Col Hursh	INITIALS		CIRCULATE
ORGANIZATION AND LOCATION	DATE		COORDINATION
2 ~~Dr Youmans~~	JZY		FILE
			INFORMATION
3			NECESSARY ACTION
			NOTE AND RETURN
4			SEE ME
			SIGNATURE

REMARKS: Maj Woodwards comment are at the back.

[illegible]

File

FROM NAME OR TITLE: RICHARD R. TAYLOR
Lieutenant Colonel, MC
Chief, [illegible] Division
[illegible] Research
[illegible]

ORGANIZATION AND LOCATION

DATE: 22 Jul 61

TELEPHONE

DD FORM 1 FEB 50 95 Replaces DA AGO Form 895, 1 Apr 48, and AFHQ Form 12, 10 Nov 47, which may be used.

GPO 1958 O-479884

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

ADQUARTERS
U. S ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
OFFICE OF THE SURGEON GENERAL
WASHINGTON 25, D. C.

APPLICATION FOR RESEARCH CONTRACT - PART 1

Form Approved
Budget Bureau No. 49-R344.1

DO NOT WRITE IN THIS SPACE
☐ NEW ☐ RENEWAL
CONTRACT NUMBER

1. TITLE OF PROJECT
Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy.

2. DATE RESEARCH CONTRACT TO BEGIN
September 1, 1961

3. NAME AND OFFICIAL POSITION OF RESPONSIBLE INVESTIGATOR
George R. Meneely, M. D., Associate Professor of Medicine and Director, Radioisotope Center

4. DATE OF APPLICATION
March 31, 1960

5. PRINCIPAL PROFESSIONAL ASSISTANT (s)

Robert M. Heyssel, M. D., Instructor in Medicine

Raymond L. Weiland, B. E., Research Associate in Electrical Engineering in Medicine

Con O. T. Ball, Instructor in Biostatistics in Preventive Medicine and Public Health

6. OTHER PROJECTS IN WHICH YOU ARE PARTICIPATING AND SOURCE OF SUPPORT *(Other government contracts or funds from civilian foundations, etc.)*

1. Radioisotope Center, Vanderbilt University
2. Capital outlay, Low Level Facility Building and Laboratories, Vanderbilt University
3. Radioisotopes in radiation processed foods, Army Medical Research and Development Command
4. Utilization of a low level whole body counting facility in the measurement of electrolyte composition and metabolism in man, U. S. Atomic Energy Commission
5. Training Grants Biophysics and Radioisotopes in Hematology, Public Health Service - National Institutes of Health

7. NAME AND LOCATION OF INSTITUTION WHERE WORK WILL BE PERFORMED

School of Medicine
Vanderbilt University
Nashville 5, Tennessee

SIGNATURE OF RESPONSIBLE INVESTIGATOR Geo. R. Meneely

8. APPLICATION APPROVED BY OFFICIAL AUTHORIZED TO SIGN FOR INSTITUTION	9. APPLICATION APPROVED BY HEAD OF DEPARTMENT WHERE WORK IS TO BE PERFORMED
NAME PRINTED OR TYPED John W. Patterson, M. D.	NAME PRINTED OR TYPED David E. Rogers, M. D.
SIGNATURE John W. Patterson	SIGNATURE David E Rogers
OFFICIAL TITLE Vice-Chancellor for Medical Affairs and Dean, School of Medicine	OFFICIAL TITLE Professor of Medicine and Head of the Department
INSTITUTION Vanderbilt University	

OTSG FORM 108 1 APR 59 PREVIOUS EDITIONS OF THIS FORM MAY BE USED.

1

Incl 1

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel Vanderbilt Univ. (MD-995)

HEADQUARTERS
U S ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
OFFICE OF THE SURGEON GENERAL
WASHINGTON 25, D. C

Form Approved
Budget Bureau No. 49-R344.1

APPLICATION FOR RESEARCH CONTRACT - PART II

TITLE OF PROJECT: Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy.

FUNDS REQUESTED *(One year only)*

REQUIREMENTS	BUDGET: REQUESTED *(From Office of The Surgeon General)*	BUDGET: OTHER SOURCES *
1. PERSONNEL *(List positions, salaries, and names of professional personnel, if known)*		
George R. Meneely, M. D., Responsible Investigator	8,000	Vanderbilt
Assistant Project Directors (Part I. 5)	15,000	AEC, PHS, Vanderbilt
6 Research Assistants - Pharmacology, Physics, Chemistry and Mathematics	22,100	"
4 Technicians - Mechanical drawing, Chemistry, Electronics and Radioisotopes		Vanderbilt
4 Secretaries and Interviewers	10,300	Vanderbilt
FICA, Blue Cross, Insurance	1,662	Vanderbilt
2. EQUIPMENT *(Itemize)*		
External programming, electronic devices	5,000	PHS, AEC & Vanderbilt
3. CONSUMABLE SUPPLIES *(Itemize)* and SERVICES		
Service Charge, Low Level Counting Bldg. & Lab.	2,500	
Other (itemized on the following page as continuation of PART II, 3.)	15,227	
4. TRAVEL *(State Purpose)*		
To confer with others working on relevant studies, attend related scientific meetings, recruit professional personnel, transport survey subjects to and from scheduled steel room appointments	2,500	
5. SUB-TOTAL	82,289	
6. OVERHEAD *(Established by official auditors with concurrence of institution or research agency and contracting officer, and may be based upon percentage of total salaries and wages, or percentage of total cost of the project. Indicate below.)* 25.78 PERCENT OF SALARIES AND WAGES ——— PERCENT TOTAL COST	14,711	
7. TOTAL BUDGET	97,000	
8. ESTIMATE OF FUTURE REQUIREMENTS *(To be filled out only if type of project indicates that it will continue for more than a year)*		
FIRST ADDITIONAL YEAR	$ 97,000	
SECOND ADDITIONAL YEAR	$ 97,000	

* *Other Sources - from the school, other contracts, other government agencies, foundations, etc.*

OTSG FORM 108a 1 APR 59 PREVIOUS E NS OF THIS FORM MAY BE USED.

2

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel Vanderbilt Univ. (MD-995)

HEADQUARTERS
U. S ARMY MEDICAL RESEARCH
AND DEVELOPMENT COMMAND
WASHINGTON 25, D. C

Form Approved
Budget Bureau No. 49-R344.1

APPLICATION FOR RESEARCH CONTRACT - PART ~~II~~ II (CONTINUED)

TITLE OF PROJECT Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy

~~RESEARCH PLAN~~

~~Include background, specific aims, methods or procedure in detail, significance of this research. Use additional pages if necessary.~~

PART II, Item 3. CONSUMABLE SUPPLIES and SERVICES (continued)

	Requested from Office of the Surgeon General	Other Sources
Consultants: Physics and Pharmacology		
Dr. Milton Bush, Assoc. Prof. of Pharmacology	1,200	Vanderbilt
Dr. Robert T. Lagemann, Prof. of Physics and Chairman of the Department		AEC, PHS & Vanderbilt
Dr. Leon Hurwitz, Asst. Prof. of Pharmacology		Vanderbilt
Dr. Fred Schumann, Prof. of Electrical Engineering and Chairman of the Department	2,400	Vanderbilt
Other consultants honorarium and travel	1,000	AEC, PHS & Vanderbilt
Linen, gowns, laundry for low level counting preparation	1,200	
Radioisotopes, laboratory glassware, chemicals, electronic components, communications	7,027	AEC, PHS & Vanderbilt
Hospital Laboratories and service charges in direct connection with subjects	2,400	"

OTSG FORM 1 FEB 59 108b PREVIOUS EDITIONS OF THIS FORM MAY BE USED.

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

HEADQUARTERS
U. S. ARMY MEDICAL RESEARCH
AND DEVELOPMENT COMMAND
WASHINGTON 25, D. C.

Form Approved
Budget Bureau No. 49-R344.1

APPLICATION FOR RESEARCH CONTRACT - PART III

TITLE OF PROJECT Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy. (PAGE 1)

RESEARCH PLAN

(Include background, specific aims, methods of procedure in detail, significance of this research. Use additional pages, if necessary.)

It is proposed to continue to approach certain military and public health problems of naturally occurring and internally administered radioisotopes by:

a) Using radioisotopes now present in the population resulting from nuclear detonations as a human "tracer" experiment in dosimetry employing the Vanderbilt low level human whole body gamma spectrometer.

b) From these data and the experience of others a preliminary analysis of the military dosimetry problem will aid in the specifications of appropriate instruments for military needs and development of one or more engineering designs for consideration.

c) Using the local population as subjects in a "tracer" experiment and animals in "tracer" or higher levels exploration of diminishing or preventing the uptake into the body or mobilizing isotopes already in the body by examining the effect of special diets, specially prepared mineral mixtures and special chemicals.

Vanderbilt Whole Body Counter Instrumentation

Equipment includes a 256 channel pulse-height analyzer, in conjunction with an 8" x 4" sodium iodide thallium activated crystal, a 4-inch thick lucite light pipe and three DuMont type 6363 multiplier-phototubes. The pulse-height analyzer presents a display on an oscilloscope of the gamma-ray spectrum over a 3 Mev range. This spectrum may then be automatically drawn on a strip-chart recorder, or printed out in tabular form by use of a Hewlett-Packard digital printer.

Calibration of the equipment in terms of quantity of body potassium^{40} and cesium^{137} has been completed, and all routine procedures concerning calibration checks and background monitoring have been established.

The spectrometry data from the low level counter obtained from a single thirty-minute run on a subject involves the processing of 2000 digits of information with this many more digits from a background run. The Vanderbilt IBM 650 computer is used to process these data. This computer first detects any error in the spectrum due to zero-drift or amplifier gain-drift by fitting a curve to the annihilation peak and to the potassium peak. It then differentiates these curves and determines the amount of these errors, and shifts the spectrum and corrects the counting rates to standard conditions, thus compensating for the original errors. The background spectrum is subtracted from the subject spectrum, channel for channel, after having been normalized to the same time. The net potassium counts per minute, its standard deviation, and its coefficient of variation are recorded. Based on normalized human potassium spectra obtained from the calibration manikin, the net cesium^{137} counts per minute are recorded. Also recorded are the subject's serial number, height, weight, surface area, and predicted BMR.

The data processed as described above are now being punched manually on 35 IBM cards per subject. Electronic equipment has been ordered which will automatically punch these cards. When connected directly to the 256 channel analyzer, the cards will be punched immediately after counting the subject.

It is felt that a single crystal for the purpose of whole body counting is insufficient, since counting-geometry is really a problem, even when using the Marinelli chair. We presently have on order eight sodium iodide crystals, 8 inches diameter, 4 inches thick. These will first be used for the purpose of testing counting efficiency and geometry considerations. The configuration presently in mind is one which places four crystals over a subject, in a horizontal position, and the other four under the

OTSG FORM 108b 1 FEB 59 PREVIOUS EDITIONS OF THIS FORM MAY BE USED.

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

HEADQUARTERS
U S ARMY MEDICAL RESEARCH
AND DEVELOPMENT COMMAND
WASHINGTON 25, D. C

Form Approved
Budget Bureau No. 49-R344.1

APPLICATION FOR RESEARCH CONTRACT - PART III

TITLE OF PROJECT Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy. (PAGE 2)

RESEARCH PLAN

(Include background, specific aims, methods of procedure in detail, significance of this research. Use additional pages, if necessary.)

subject. Our present single crystal and chair assembly will remain intact in the steel room so that work with this sytem may continue.

A Berkeley Model 4904 Double Pulse Generator is used by the electronic shop in the routine maintenance of scalers and spectrometers. It is also used in testing resolving time, counting speed, and pulse-height calibration of new equipment designed in connection with low-level counting.

Standards, Prophylaxis and Therapy

Studies in the steel room to date have been primarily concerned with standardization of the room for human total body potassium by using the naturally occurring radioisotope K^{40}. A standard-sized plastic calibration manikin has been filled with solutions of potassium of varying strengths and a factor has been calculated which relates counts per minute at the photopeak of K^{40} to grams of potassium present in the standard calibration manikin. This factor for the steel room with the present standard geometry is calculated to be 1.16. Other studies have indicated that considerations of geometry due to the variations in humans are such that a single crystal setup will require a number of different factors related to differing heights and weights of human subjects.

We have been fortunate enough to study one patient, A. R., who was admitted to Vanderbilt Hospital with extremely low potassium and who was the same height and approximate weight as our standard manikin. A remarkable correlation between serum potassium and total body potassium was found.

TABLE I

Patient A. R. 34 year old Female

DATE	POTASSIUM-40 COUNTS PER MINUTE	1.16 x CPM TOTAL POTASSIUM	SERUM K+
1/23/60	61.88 cpm	71.78 gm	2.6 mEq
1/25/60	76.45	88.68	4.7
1/26/60	75.06	87.07	5.1
1/27/60	76.48	88.72	5.5
1/28/60	74.63	86.57	5.4
1/29/60	72.19	83.74	4.6
2/ 1/60	70.02	81.22	4.3
2/ 2/60	70.11	81.33	5.1
2/ 3/60	71.88	82.45	4.0
2/ 4/60	63.03	73.12	4.0
2/ 5/60	65.52	76.00	3.4
2/24/60	60.14	69.76	2.4

For the period between the noon whole body count on the 23rd and the morning count on the 25th, metabolic balance studies indicated a net gain in body K of 17.82 gm. while the whole body counts showed a net gain of 16.90 gm. for the same period.

OTSG FORM 1 FEB 59 108b PREVIOUS EDITIONS OF THIS FORM MAY BE USED.

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

HEADQUARTERS
U. S. ARMY MEDICAL RESEARCH
AND DEVELOPMENT COMMAND
WASHINGTON 25, D. C.

Form Approved
Budget Bureau No. 49-R344.1

APPLICATION FOR RESEARCH CONTRACT - PART III

TITLE OF PROJECT: Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy.

RESEARCH PLAN (PAGE 3)

(Include background, specific aims, methods of procedure in detail, significance of this research. Use additional pages, if necessary.)

Correlation of the whole body counting data with metabolic balance done by chemical methods indicated that during a period of time when this patient was said to have retained 17.89 grams of potassium by metabolic methods, the whole body counts indicated the patient had retained 16.90 grams. The metabolic data did not take into account stool losses of potassium.

The room has also been calibrated for cesium-137 in humans, again using the standard man technique and again realizing that considerations of geometry do not make the same factor applicable to all individuals. The calibration factor was found to be 0.495 muc/net cpm for cesium-137. We have calculated the cesium-137 in the 200 individuals we have surveyed. Total body cesium-137 burdens by this method vary between 1 muc to 8 muc. These data agree closely with the results reported by the groups at Argonne and Los Alamos.

In addition to these studies we consider basic to the program, we have begun to follow the biologic half life of chromium-51 in individuals in whom the chromium-51 has been used to label red cells. Preliminary findings indicate that the biologic half life in the individual probably varies with the red cell life span as measured with this method. In one individual whose calculated red cell life span by the chromium-51 method was 15 days, the biologic half life of the chromium-51 in the individual was quite comparable, and in another individual with a 28 day chromium-51 life span (our laboratory normal) the biologic half life was only slightly longer than this. The possibility that the whole body counter can be used as a method of measuring red cell life span will be further investigated. This would have considerable advantage over measuring disappearance of blood radioactivity since changes in hematocrit or total blood volume make measurement of red cell life span, in situations other than a steady state, difficult to interpret.

Studies are now underway to standardize the steel room for Fe^{59} in humans in order to investigate iron absorption and total iron turnover rates in humans using Fe^{59} tracer doses.

Plans include the followup of patients given I^{131} to investigate biologic half life as well as cobalt-60 labelled B_{12}. Study of whole body sodium turnover is also in the planning stage.

Published work on the general physiological effects and the metabolism of cesium established the following facts:

1) The cesium ion behaves like potassium ion and can replace potassium ion in animal tissues to a certain extent in various physical and physiological phenomena, but it can never be a substitute for potassium.

2) Cesium accumulates in soft tissues against a concentration gradient. A part of this can be replaced by increased potassium intake through food. This means that these tissues show a preference for potassium over cesium.

3) The absorption, distribution and excretion patterns of cesium can be modified by the composition of food and the administration of certain hormones. The excretion of cesium can be increased or decreased depending on the hormone and other dietary factors.

No definite information on the effects of drugs on the metabolism of cesium is available. There are many drugs which cause hypopotassemia by different mechanisms. Studies on the influence of these drugs on the patterns of cesium excretion may yield

OTSG FORM 1 FEB 49 108b PREVIOUS EDITIONS OF THIS FORM MAY BE USED

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

HEADQUARTERS
U. S. ARMY MEDICAL RESEARCH
AND DEVELOPMENT COMMAND
WASHINGTON 25, D. C

Form Approved
Budget Bureau No. 49-R344.1

APPLICATION FOR RESEARCH CONTRACT - PART III

TITLE OF PROJECT Human Internal Radiation Dosimetry. Instrumentation, prophylaxis and therapy. (PAGE 4)

RESEARCH PLAN

(Include background, specific aims, methods of procedure in detail, significance of this research. Use additional pages, if necessary.)

useful information regarding the mechanisms by which alkali ions are handled by the living tissue. For the initial studies, the compounds desoxycoticosterone acetate, 9-α-flurohydrocortisone, aminophylline, mercurophylline and chlorothiazide have been selected. These studies will include: 1) kinetic patterns of the distribution and excretion of cesium-137 and rubidium-86 as compared to potassium, and the influence of these drugs on the metabolic patterns of the alkali ions; and 2) influence of these agents and autonomic drugs on the transport of cesium into the cells of soft tissues.

These studies will yield different types of useful information, such as normal excretary patterns of cesium-137 and other alkali ions and how drugs influence these patterns, mechanisms of handling alkali metals by kidney, occurrence of concurrent hypopotassemia and hypocesemia in animals with large accumulation of radiocesium in soft tissues, and correlations between the physicochemical properties and biological behaviour of alkali ions.

To delineate potassium and cesium present in the local population in age, sex, and body build parameters we are taking a 10% sub sample of the universe as constituted in Dr. Louis Zeidberg's, Professor of Epidemiology, Vanderbilt University School of Medicine, randomly selected 300 households representative of prevailing socioeconomic and air pollutant conditions. Some 1000 individual subjects will be measured.

OTSG FORM 108b
1 FEB 59

PREVIOUS EDITIONS OF THIS FORM MAY BE USED.

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

DISPOSITION FORM

SECURITY CLASSIFICATION (If any)

FILE NO.	SUBJECT
MEDEC-ZOB	Evaluation of Research Application entitled "Human Internal Radiation Dosimetry", Vanderbilt Univ., Sep 61

TO	FROM	DATE	COMMENT NO. 1
Director, WRAIR	Department of Biophysics MD	15 July 1960	

1. This application for a large research contract is notably non-specific and touches on a wide variety of known uses for whole body gamma-ray spectrometers. The objectives listed are (a) Cs-137 fallout measurements in people at Vanderbilt, (b) improvement of instrumentation for military dosimetry and (c) the prevention of absorption or the enhancement of excretion of radio-elements in humans or animals.

2. Cesium-137 fallout measurements in humans are available in good quantity from laboratories in the U. S. and Europe. These measurements are particularly lacking from South America, Africa, Asia and the Far East. However, if Vanderbilt should concentrate on a specific age group, particularly children, this would add to an age group less frequently sampled.

3. As to a "military dosimetry problem" I am not aware of this in relation to whole body gamma detectors, for sensitivity approximates 10^{-11} curies at the present time. Furthermore, Vanderbilt is not known for any design or engineering contribution to whole body counters at the present time. An additional reflection is that this group has purchased eight large NaI crystals at considerable cost to investigate geometry-sensitivity problems. Rondo at Harwell, England has already shown that four smaller crystals will eliminate geometry dependence for all practical purposes. Sensitivity increases are a matter of much smaller degree and should be forthcoming from the impetus created by the U. S. Public Health Service for instrumentation needed in their radiological survey centers.

4. Information contained on page 2 under "Standards, Prophylaxis and Therapy" is similar to data generated and reported from WRAIR involving body potassium changes and radioisotope retention and excretion in the human subject. This is the general field of endeavor, however, best suited to a medical center with the Human Counter capabilities now available at Vanderbilt.

5. Recommendations

5.1 That the present application be returned with advice to re-submit a specific protocol(s) related to metabolism, body composition, or diagnosis using radio-elements including body potassium in the normal and diseased subject.

5.2 The support level requested in the present application includes 14 personnel and an additional 4 consultants which is completely unreasonable and unrealistic for the work outlined.

5.3 I could not recommend the approval of the application in its present form.

5.4 Dr. Ernest C. Anderson, Los Alamos Scientific Lab, is the outstanding authority on design and applications of whole body counters. He is on the

DD FORM 1 FEB 50 96 REPLACES NME FORM 96, 1 OCT 48 WHICH MAY BE USED

Incl 2

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4-813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-9/95)

MEDEC-ZOB 15 July 1960

SUBJECT: Evaluation of Research Application entitled, "Human Internal Radiation Dosimetry", Vanderbilt University, for September 1961

consultants' list of the Commanding General, Army Medical Service Research and Development Command, and his opinion regarding this application would be most advisable.

Kent T. Woodward

KENT T. WOODWARD
Major, MC
Chief, Department of Biophysics

2 Incl
DF and application

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4813
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)

Meneely

DISPOSITION FORM

SECURITY CI FICATION (If any)

FILE NO.

SUBJECT Evaluation of Research Contract - George R. Meneely, M.D., "Human Internal Radiation Dosimetry".

TO Director of WRAIR

FROM Chief, Research Div. Med Resch & Devlpmt Cmmd

DATE 6 July '60

COMMENT NO. 1

Col Taylor/mhs/61209

In November 1959 the Medical Research and Development Command contract program in ionizing radiation was reviewed by ARO and representatives of WRAIR. A comment on contract MD-995 from Doctor George R. Meneely requested that future renewals should be evaluated by WRAIR. Attached renewal application is forwarded for your comments and recommendations.

FOR THE COMMANDER:

Incl: 1 a/s

Richard R. Taylor
RICHARD R. TAYLOR
Lt. Col., MC
Chief, Research Division

MEDEC-ZDD

TO CG, USAMedR&DComd
ATTN: Ch, Rsch Div
Main Navy Bldg

FROM Dir, WRAIR

DATE 21 Jul 60

COMMENT NO. 2

1. After discussion with Col Hursh, Project Officer, R&D Comd, who is concerned with subject proposal, the attached comments of Major Woodward (incl 2) are forwarded unchanged to the R&D Comd.

2. I heartily agree with Major Woodward's suggestion that the younger age group measurements of C-137 would be particularly useful and could be accomplished by the Vanderbilt University.

3. In general, I agree with Major Woodward's comments concerning "military dosimetry problem" as mentioned paragraph 3, incl 2.

4. I also believe that the number of personnel requested for work on this project is entirely excessive.

5. Likewise I believe that Dr. E C Anderson of the Los Alamos Scientific Lab is a most competent individual and his advice would be particularly useful.

6. I am, therefore, of the opinion that the proposal should be re-oriented as suggested by Maj Woodward and related to metabolism and body composition at a much reduced expenditure of funds.

2 Incls
Added 1 incl
2. as

Tyron E. Huber
TYRON E. HUBER
Colonel, MC
Director

DD FORM 1 FEB 50 96 REPLACES NME FORM 96, 1 OCT 48 WHICH MAY BE USED

648—16—54801-3 U.S. GOVERNMENT PRINTING OFFICE

Washington National Record Center
Office of the Army Surgeon General
Record Group 112
Accession #: 67A-4-873
Box #: 6
File: 1303-25 Heyssel, Vanderbilt Univ. (MD-995)