138-4

~~TOP SECRET~~

6 September 1962

MEMORANDUM FOR: THE RECORD

SUBJECT : Project MKULTRA, Subproject 138

1. The purpose of this subproject is to continue the work of [redacted] on Biomedical Instrumentation at the University of Texas. [redacted] is an accomplished innovator in many fields of instrumentation and has made some fundamental contributions to various kinds of measuring devices. He will work under the direction of [redacted] in this project.

2. As is indicated in the attached proposal and interim report, work will begin with an attempt to evaluate the possibility of altering the properties of the various interfaces (space-human tissue, etc.) involved in biological systems of interest in ways that will facilitate remote polygraph type measurement by the use of various forms of incident radiant energy as is being studied in other current research projects. Information made available in this study will be of interest in connection with the problem of body antennas, personnel tagging, polygraphy and other areas. It should be emphasized that this particular approach, as far as is known, has never been explored. For this reason it is not presently possible to go into great detail as to the exact experimental lines to be followed.

(b)(3)

3. The Geshickter Fund for Medical Research shall function as cover and cut-out for this project. As indicated in the attached proposal, the cost of the program for one year will be $16,644.00. To this must be added $665.76 which represents the service charge due the cut-out. The total cost of

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[redacted]

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project for one year will therefore not exceed $17,309.76. Charges should be made against Allotment No. 3125-1390-3902.

4. Title to the equipment purchased shall remain with the University of Texas in lieu of higher overhead costs.

5. Documentation and accounting for travel expenses under this project which are reimbursable by Texas University will conform to the accepted practices of that Institution.

6. This project will operate on an unwitting basis. There are no cleared individuals beyond the Geschickter Fund for Medical Research.

[redacted]
Chief
TSD/[redacted] Branch

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PROPOSAL

The investigation will be of an exploratory nature, examining recognized, but not well understood, properties or characteristics of materials and phenomena which could perform useful functions in miniature bio-medical sensors. The project is expected at least to begin with the study of extremely fine fibers or micro-filaments. These filaments afford many properties of conceivable applicability to the sensing of dynamic parameters of biological systems at the cellular and organic levels.

Some filaments are known to possess very great unit strength compared to the same materials in greater bulk. Due to their fine dimension, very great lengths of the filaments can occupy small space and have small weight. Their fine dimension should enable filaments to faithfully transmit mechanical stress or pressure pulses of even high frequency with a minimum of distortion. Micro-filaments can penetrate tissue without surgery and with a minimum of biological damage.

Some fibers are electrical conductors, while others are insulators. Some transmit light, while others are opaque. The surface of filaments can be coated with conductive, semiconductive, or insulating films, or with films which can radiate or respond to heat, light, pressure, etc.

These are but a few of the properties which characterize micro-filaments, properties which are apparent or can be surmised. Compared to study of characteristics of materials of larger dimension, relatively little effort has been expended on examining recognized properties or looking for new properties or useful interrelations between properties of materials in very small dimension.

The object of this investigation will be to examine such properties of materials individually and in combination in the context of bio-medical applicability.

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The investigation will be performed primarily in the laboratories of the Engineering Mechanics Department of the University of Texas in Austin, Texas. The laboratory facilities include modern oscillographic and other electronic instruments as well as adequate machine shop facilities for construction and modification of experimental apparatus.

The instruments and facilities of adjacent scientific laboratories will also be available as needed. There are available instruments for a wide range of mechanical, electrical, and optical measurements including electron microscopy. Vapor coating at high vacuum may also be performed on the campus. For analysis and computation, the Engineering Computation Center is equipped with modern digital and analog computers.

The University is also noted for its work in the areas of medical and life sciences. The staff of departments in these areas can offer consultation and stimulation in areas of mutual interest.

BUDGET

I.	PERSONNEL	
	Principal Investigator	-0-
	Other	$ 9,200.00
II.	SUPPLIES AND SERVICES	4,500.00
III.	TRAVEL AND COMMUNICATION	600.00
IV.	INCIDENTAL EXPENSES	300.00
V.	OVERHEAD @ 14%	2,044.00
	TOTAL	$16,644.00

INTERIM REPORT

Project [redacted] Phenomena for Bio-Medical Instrumentation

The initial months under the Medical Sciences Research Foundation Grant have been devoted to preparation for and the beginning of experimental work relating to microscopic quartz filaments and their utilization in minute bio-medical sensors.

During the first months of the grant period, a literature search was conducted to establish the location of source material historically or currently related to fibers of quartz and other materials and to minature sensors which have found application in clinical medicine and research physiology. Selected references from the extensive bibliography were selected for detailed study. The primary emphasis was on the available technology of fibers and microcapillaries, microscopy, high vacuum, and vacuum deposition techniques. A technique for producing fine filaments of glass was mastered using simple equipment which was available. These glass filaments were used to anticipate the specific needs for fabricating, handling, and observing instruments so that tentative requirements for these necessary research tools could be established.

The Interim Report is prepared for submission with the application for continuation of the research grant. The detailed terminal report for the work of the year 1961-1962 will be submitted in October, 1962.

As the grant funds became available for expenditure at years end, it was possible to order components for the vacuum deposition system which will perform a central role in the experimental study. The assembly of the components into a deposition system is substantially complete. High temperature oxy-hydrogen equipment has allowed the drawing of fine filaments of quartz to sub-micron size. Preliminary techniques for forming and handling the extremely fine fibers have been utilized to obtain the filamentary materials of the type which will be used in the study. Experience gained in handling and viewing these fibers with microscopic equipment obtained on temporary loan has established the specific requirements for this instrument.

While work with the actual materials of the investigation has only recently begun, it is anticipated that vacuum deposition of materials with useful properties onto the microscopic quartz fibers will be attempted by mid-summer.