UNIVERSITY OF Minnesota

SCHOOL OF PUBLIC HEALTH · LABORATORY OF PHYSIOLOGICAL HYGIENE
STADIUM GATE 27 · MINNEAPOLIS, MINNESOTA 55455

August 17, 1967

Richard Varco, M.D.
Professor of Surgery
Variety Club Heart Hospital
University of Minnesota
Minneapolis, Minnesota 55455

Dear Dr. Varco:

This is in reponse to your request for an estimate of the space and facility requirements projected for this Laboratory over the next 10 years.

Dr. Keys has estimated that the Laboratory will require 16,000 square feet of space for efficient operation over the next 5 years. It is my understanding that this estimate does not include public corridors. It does not seem unreasonable to think in terms of 20,000 square feet for requirements 10 years from now.

The Laboratory has been engaged in the study of the personal habits and characteristics of free living man and their relationship to the development of chronic disease. Major emphasis is on nutrition and lipid metabolism accompanied by systematic studies of physical activity. Data is collected in population groups (N = 300 to 3,000) who are studied either in the field or in the Laboratory and in some cases in both places. These activities proceed hand in hand with intensive nutritional investigations on small groups (10 to 50 men) which may or may not require controlled physical activity and environmental temperature.

It is not possible to forecast with precision the needs of the Laboratory except in general areas that will be cultivated. It is expected that factors affecting

personal characteristics related or presumed to be related to the development of future disease, principally cardiovascular, will be studied both in the Laboratory and within the community for some time to come.

This is a first statement of Laboratory needs and represents staff opinion since it does not present Dr. Keys personal judgement. It will no doubt be modified.

Sincerely,

Henry L. Taylor

HLT/ljs
enclosure
cc: Dr. Ancel Keys
Dr. Henry Blackburn
Dr. F. Grande
Dr. J. T. Anderson
Dr. E. S. Fetcher
Dr. M. Cavert
Mr. R. W. Parlin

A. / Population Studies

Samples of the population are systematically and frequently examined in the Laboratory. This requires space for dressing, waiting and a series of "stations" where interviews, tests and measurements and physical examinations can be conducted. Since the majority of subjects are volunteers, experience has shown that it is of considerable importance to provide easy and efficient access to the Laboratory.

An item of high priority then is parking space for subjects and an efficient arrangement which make it simple and pleasant for subjects to find their destination.

In the past, the programs in which the Laboratory has been involved have required processing 4 to 15 subjects a half day in the central Laboratory. The trend in this work is toward greater automation and increased capacity to handle subjects. It is worthwhile mentioning that in the study of disease and/or predisease characteristics in population groups, the ball game (after you have decided what to do) can be won or lost in the process of getting, etc., the members of the sample through the front door.

B/ Data Processing

The large population groups that are understudy by the Laboratory staff have made it necessary to establish a data processing unit. This now consists principally of business machines for punching and handling punch cards. A small electronic calculator has recently been installed which is adequate to handle data from small to intermediate size groups and calculations that are not too complex. Larger problems and,those involving sizable volumns of data, are handled outside the Laboratory principally in University computer facilities. In the future, it is hoped to establish communications by wire with a large digital computer. This will require space for input output equipment and connections in the Laboratory. Electrocardiograms are currently being recorded on magnetic tape and analyzed outside of Minneapolis. It is expected that work in this area will increase and such data processing will be carried out in this Laboratory. It is highly probable that online analysis and immediate read out will be required in special physiological studies. Card handling equipment, tape transports and computers produce heat and require attention from air-conditioning experts.

Preparation of data for use by a computer will remain a major problem. The work is clerical in nature but it requires space for handling subjects files and more particularly space for storing files. Finally some provisions must be made to protect data necessary to the completion of any long term follow-up studies.

C. / Metabolic and Nutritional Experiments

Work in this area involves feeding groups of 4 to 30 subjects 3 meals a day with measurements varying from the routine to the complex. Fixed installations are obviously the kitchen, small dining room, and dry food storage facilities. Since some of these experiments employ radioactive tracers, accordingly, facilities for handling radioactive materials are required. Storage of samples of serum, feces, urine and meals is a continuing problem in the operations of this Laboratory. Adequate storage space at -20C° is required.

Body composition determinations are of consequence in some metabolic experiments so facilities for underwater weighing should be included.

Certain metabolic experiments require-in-laboratory housing of subjects. It is believed that this requires flexible space which can be used for several purposes but requires the installations of services some of which (such as bathroom) may be permanent installations.

There is a real possibility that a metabolic chamber will be required. in which a subject can be housed with eating, sleeping and exercise facilities. Planning should provide space in which such a facility can be installed.

D. / Physical Activity and Environmental Control

The study of the effects of environment and/or physical activity on the cardiovascular respiratory system has been a continuing activity in this Laboratory. In addition, it has been useful in metabolic experiments to vary the total energy expenditure by requiring subjects to perform specific amounts of work. Cardiovascular function has been profitably studied in extremes of temperature and humidity and the influence of sweating on metabolic balances is important in many studies of metabolism and accordingly an area in which the temperature and humidity can be controlled over a wide range is an important fixed installation in the Laboratory of Physiological Hygiene. This area should contain a large treadmill which will accommodate 4 individuals walking at one time and a smaller treadmill for studying both walking and running. An instrumentation room should be attached. Facilities for providing oxygen at specified concentrations and in amounts large enough to study subjects at rest or work should be available.

E. / Provisions for Efficient Utilization of Space

Past experience has been that space requirements for the various research programs conducted by the Laboratory Staff vary with time. It is proposed that the possibility of module construction be investigated to allow rearrangement of laboratory rooms to provide for efficient utilization of available space provided for the handling and examination of subjects.

In any event, the constantly changing demand for physiological apparatus, beds and other equipment and furnishings makes a store room essential. This area is, of course, out side that required for the usual storage space required to run a good size chemistry laboratory efficiently.

F. / The central installations around which much of the laboratory's work revolves is the chemistry laboratory equipped to analyze food, blood, urine and feces. There is, of course, an important emphasis on lipid chemistry. To conduct work of this kind, a walk in cooler operated at 4C° is important and storage space for flammable fluids is essential if fire regulations are to be observed. Provision for storage of bottled gas outside the building is considered important.