

Notes on the Laboratory of Physiological Hygiene and problems of experimental human physiology. A memorandum by Ancel Keys on the U of Minnesota Archives website, dated April 12, 1944.

<http://brickhouse.lib.umn.edu/items/show/449>

The memorandum justifies the continuation of the Laboratory after World War II by arguing that research in experimental human physiology “should be not less in peace time and that the utility of this Laboratory should actually increase when the pressure of world necessity diminishes.”

So, Keys was under pressure as member of the Department of Physiology to review and advance the status of human experimental physiology at Minnesota.

He explains (and complains) that the net result of medical school organization around basic science or “fundamental” departments and clinical departments inhibits experimental human physiology and its opportunity for broader development related to health and disease. Escape from these limitations would call either for drastic revision of medical school organization or the provision of a special division for research and teaching in the experimental study of human physiology” (1). He describes the organization of this kind of division with examples of laboratories developed over the past 20 years in Copenhagen, Germany, Russia, Italy, Japan, and at Harvard University’s Fatigue Laboratory and refers particularly to the Maxim Gorky Institute of Experimental Medicine in Moscow.

The Minnesota Laboratory of Physiological Hygiene dates from 1937 and wartime needs demonstrated the critical importance of the Minnesota and the Harvard laboratories. They were “the only relatively permanent organizations . . . devoted to the broad problems of experimental human physiology” (2).

The relationship of experimental human physiology to the field of public health and hygiene is frequently overlooked, he maintains. “Public health, preventive medicine and hygiene have made tremendous developments, but these have been almost wholly in fields of sanitation, infectious diseases, and medical service organization. Physiological hygiene has received scant attention, except for the field of industrial toxicology. [Moreover] the present enthusiasm for nutrition has proceeded with little effort to obtain the proper bases in precise experimentation on human functions. There is an extraordinary lack of concrete knowledge . . . about questions of rest, sleep, exercise, fatigue, fasting, training, size and space of meals, adjustments to temperature, altitude and posture, baths, alcohol, tobacco and so on, [which] at present must be discussed largely on the basis of personal opinions, surmises and previous customs. It would be reasonable to suppose that preventive medicine should be concerned about these matters, and that more exact knowledge could be of real value in the maintenance of health and restoration to full fitness after disability; , , solutions to many problems in degenerative diseases and in geriatrics must be sought, in part at least, in the field of physiological hygiene”(2).

Keys recounts the history of the Laboratory origins:

“The development of the Laboratory of Physiological Hygiene, University of Minnesota, began at the end of 1937 as a joint enterprise between the Medical School and the Department of Physical Education. The initial aim was to provide improved instruction in the basic medical sciences for students in physical education and related fields, and to allow their development in scientific studies on human activity and ‘fitness.’ The provision of essential laboratory facilities and personnel allowed the start of experimental work in physiological hygiene in the fall of 1939. Full-scale operations have been underway since 1942” (2).

The National Research Council and the military supported much of the work, and during the war the LPH attained “a high degree of efficiency in specific methods and integration of the effort, which is so important”(2).

Recent work in the LPH is detailed: on vitamins in relation to work performance and fatigue, the requirements for vitamins, the deterioration that may be produced by partial starvation, disability in man from heat, emergency rations for military operations, physical and psychomotor training and de-training, vitamin contents of military rations, objective alterations of function produced by the absence of the B vitamins, psychological tests and measurements in the evaluation of fatigue and fitness, methods for estimating vitamin and fluids in human sweat and excreta, effects of physical training on heart size, the evaluation and magnitude of effects of circulatory abnormality in patent ductus arteriosus, and much development of laboratory methods.

The faculty is documented along with their courses within and independent of their home departments. The faculty includes Ancel Keys, physiologist, Austin Henschel, biologist; Olaf Mickelsen, chemist; Henry Taylor, physiologist; Josef Brozek, psychologist. Staff includes Angie Mae Sturgeon, head technologist; Doris Doeden, Webster Vinton, chemists; Howard Condess, chemist; Erma Etner-Manure, chemist; Luella Hong, secretary, Nedra Foster, dietician.

The bibliography dates from February 1940 to April 1944, representing the first 40 publications of the LPH, mainly about vitamins and fatigue and fitness. The web exhibit includes a photograph of a handsome young couple, unidentified, in dress reflecting the period (1953), and shows them on the lawn and among the trees once outside Gate 27 showing the original asphalt sign, Laboratory of Physiological Hygiene. A program announces publication of *The Biology of Human Starvation* by the U of Minnesota Press with the celebration to be held in the main

ballroom of Coffman Union, June 2, 1950, for the book that made Keys and the LPH world renown..

The web exhibit also contains an historic picture of a young man getting an electrocardiogram taken by Ernst Simonson, a technician, and Prof. Otto Schmitt. Standing at the foot of the bed in a patient's gown is Arthur Barry, then chairman of the board of General Mills, on what is obviously a CVD annual examination day in that first CVD prospective study. A photographer is checking lighting for a film, presumably the CBS film, *The Search*, made in 1952. In another photograph, Joseph Brozek operates the scale as they submerge a subject for underwater weighting.

The Stadium exhibit otherwise is a mix of artifacts, letters and programs, with no narrative or chronology, about the Laboratory and about Jean Piccard and the launching of his stratospheric balloon in the Stadium and its landing wherever. There are two formal portraits of Ancel Keys, one taken in 1958, and one in 1938 as the very young head of the Laboratory. He would have been 34 years old.

Henry Blackburn 2009.