

and reward that strengthen tendencies to think and do, operate upon tendencies to like and dislike.

"If sound methods are used, men

can be taught to find satisfaction in useful work, healthful and noble recreation, and the welfare of others, to a degree that the world has never seen."

Science News Letter, January 4, 1936

PHYSIOLOGY

Tests of Nervous System Made in Cellar Laboratory

Changing Thickness of Finger, Index of Expanding Blood Vessels, Gives Clue to Sympathetic System

NEW light on the working of the sympathetic, or involuntary, nervous system is being shed by research carried on at the National Hospital for Nervous Diseases in London.

Until some of the results of the research are published in scientific journals, in the near future, the neurologists conducting it wish to preserve strict anonymity. The reason that public attention has been focussed on the Hospital and its researches is that the Rockefeller Foundation has offered provisional grants totalling \$600,000 toward new laboratories and the endowment of their work.

The research on the sympathetic nervous system is being carried on in a subterranean cellar which at one time belonged to a convent. Outside is a red-lettered notice reading "It is dangerous to open this door," for elaborate experiments are being made on human beings, and the sudden opening of the door might startle the subject and lead to his being hurt.

It is the sympathetic nervous system which is responsible for the beating of the heart, for the movements of the digestive organs and for all other bodily processes that are performed without conscious effort. It is also concerned with the various links between the emotions and physical reactions, such as that between fear and the bristling of hair which in human beings is chiefly noticeable in the effect called "gooseskin." Little is as yet known as to the details of how and why the activity of this involuntary nervous system varies among normal human beings—that is, for instance, why one of two brothers may be much more "highly strung" than another.

It is toward the solution of these and many other allied problems that this research is directed. The essence of the

method lies in the measuring of reactions of the sympathetic nerves through recording changes in the blood-vessels, whose size is governed by the sympathetic system.

In practice, the thickness of a finger, which alters with the expansion and contraction of its multitude of minute blood-vessels, serves as the criterion. The changes of volume are naturally extremely small, but they are magnified by the apparatus—a pneumatic system being connected at one end to a sealed rubber finger-stall and at the other to an arrangement of mirrors—and are finally recorded photographically, along

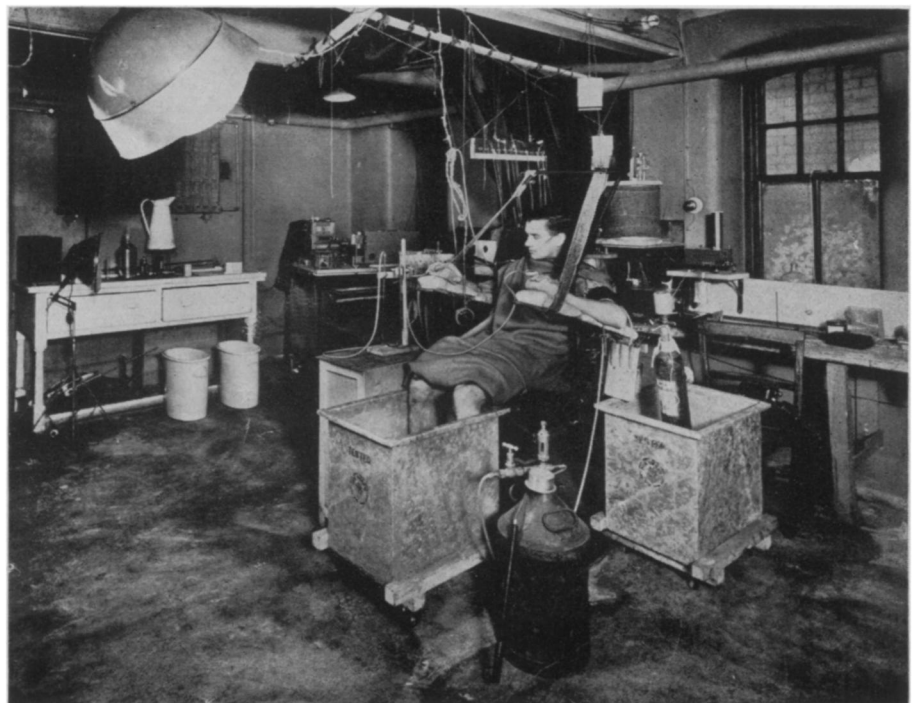
with a time-scale, on a moving roll of bromide paper.

An important feature of these experiments is that the subject is made to keep his feet in warm water. This neutralizes the ordinary effect of slight changes in room temperature. Normally these changes cause frequent slight variations in the sympathetic and vascular systems, and such variations would affect the accuracy of measurements of other sympathetic reactions.

Experiments have been made with subjects some of whose sympathetic nerves have been severed by accident or disease, or whose brains have been injured, as by the removal of brain tumors. Work on the latter type of case has shown almost certainly that the sympathetic nervous system can function normally even though the cortex is badly injured.

This important result, which suggests that the human sympathetic nervous system is centered in the diencephalon (at the base of the brain, near the pituitary or "master-gland"), will shortly be published in a scientific journal. It confirms the result recently reported by Dr. S. W. Ranson, of Northwestern University, Evanston, as the result of experimental work on animals.

Science News Letter, January 4, 1936



WHERE NERVES ARE TESTED

Apparatus for testing nerve reactions in the cellar laboratory of the National Hospital for Nervous Diseases, London. The foot bath is to neutralize the effect of slight changes of room temperature. A pneumatic system is connected to the man's finger to record the expansion and contraction of minute blood vessels.