

metabolism was announced by Dr. C. N. H. Long, of Yale University School of Medicine.

The gland achieves its control over carbohydrates and proteins through three mechanisms as follows:

(1) Conversion of simple proteins into more complex ones in fed animals is speeded up or the breakdown of protein is slowed in fasted animals by one pituitary gland substance, probably the growth hormone.

(2) Another pituitary gland substance operates through the adrenal gland cortex to increase the breakdown of protein and consequently the formation of carbohydrates from protein or fat, in fasted animals. In fed animals this mechanism operates to diminish the proportion of carbohydrate oxidized.

(3) Utilization of carbohydrate in fed animals is checked by a pituitary gland factor which acts independently of any other gland factor.

Hormone for Old Men Rats

OLD gentlemen rats that had lost their youthful vigor were stimulated to renewed activity when given doses of a female sex hormone, emmenin, and a special extract of the adrenal gland, Dr. R. G. Hoskins and associates, Helen M. Levene and Sylvia Bevin, of Harvard Medical School, reported. Other gland preparations and various vitamin preparations did not succeed in making lively fellows of the old rats. Why the adrenal and female sex hormones were effective has not yet been explained.

Brain Waves Guide to Shock

BRAIN wave studies can furnish an exact guide to insulin shock treatment of the widespread mental sickness, schizophrenia, Dr. Harold E. Himwich, of Albany Medical College, Union University, reported.

During the treatment, he found, the changes in body chemistry, especially in the brain, and in the patient's symptoms fall into two phases which are paralleled by changes in the brain wave pattern. The best results of the treatment are associated with the second phase, when the patient becomes unconscious and when the alpha waves disappear from the brain wave records.

Brain wave records of the patients during treatment, it therefore appears, can be used to mark exactly the beginning of this therapeutically important part of the treatment.

Science News Letter, May 20, 1939

PSYCHIATRY

No "Speech Center" in Brain, Psychiatrist Declares

Psychiatrists Hear Also That Removal of Frontal Lobes Indicates They Govern Abstract Thought and Planning

NO SPECIAL physiologic and psychic mechanisms for speech exist, Dr. Leland B. Alford of St. Louis declared at the meeting of the American Psychiatric Association in Chicago. Speech is part of general brain activity rather than the exclusive function of a special group of cells, in Dr. Alford's opinion.

The idea of a special speech mechanism in the human brain arose, Dr. Alford indicated, from the fact that injury to a certain area in the brain results in aphasia, a condition in which the patient either cannot speak at all or can only speak haltingly and with great difficulty. Some patients, however, recover their ability to speak after such brain injury, Dr. Alford pointed out.

The loss of ability to speak in these cases is due, Dr. Alford believes, to the fact that following the brain injury the patient is in a markedly unstable mental state. His mentality is qualitatively complete, but he is subject to confusion, fatigue and emotional excitement. It is this unstable mental state that causes the aphasia, and not the destruction of any special speech mechanism, Dr. Alford believes.

Patients may be able to speak at the beginning of a psychological test, for example, but as they get tired or find the test more difficult or tedious, their unstable mental state leads them to take refuge in speechlessness, much as a neurotic patient might use speechlessness to escape a difficult situation.

The problem of locating brain activity in certain brain areas was attacked from another angle in studies of patients in whom the frontal brain lobes had been removed in operations for removal of brain tumors.

Lose Ability To Plan

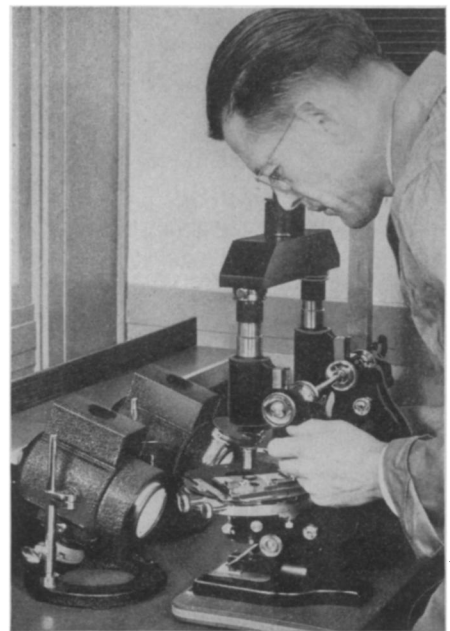
GENERAL intelligence is not much affected by loss of the frontal lobes, but ability to handle problems and plan a line of attack is lost, Dr. Ira C. Nichols, of Providence, R. I. found from studying such cases. For example, one of these patients could not play even a fair game

of checkers because he had lost the ability to formulate an attack. Hope for rehabilitation of such patients by re-education, however, appears from the fact that when the game of checkers was explained and the various moves shown, the patient learned quickly and six months later still made use of the information.

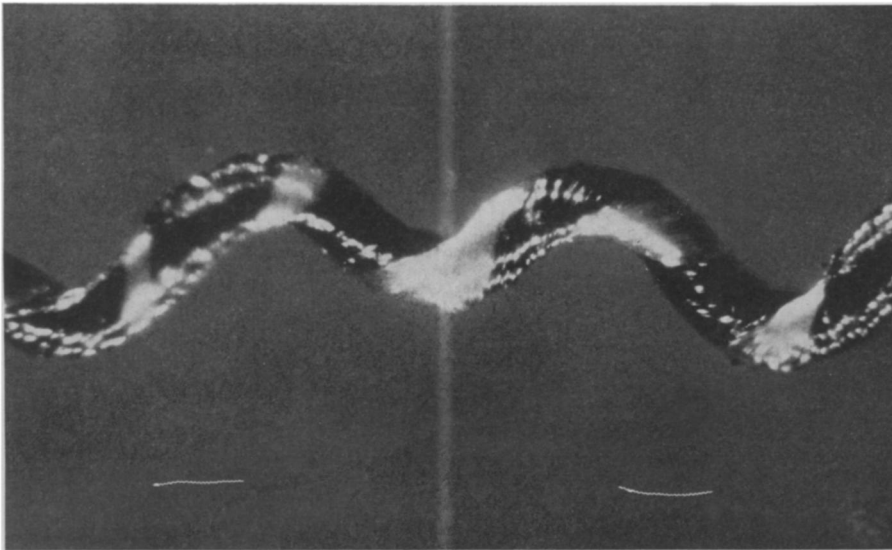
Further evidence that the frontal lobes of the brain are responsible for abstract thinking was reported by Dr. Ward C. Halstead of the University of Chicago. Patients without frontal lobes, he found, had difficulty grouping objects according to categories, that is by size, shape, color or some other common factor. This difficulty with abstract thinking following loss of the frontal lobes was apparent even in patients who had made good social adjustments following their operations.

The category test, Dr. Halstead pointed out, can also be used, other investigators have reported, in predicting the results of shock treatment for certain mental disorders.

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WEAPON AGAINST CRIME



PERFECT MATCH!

With the FBI's new comparison microscope shown on page 310, two threads can be brought together and blended optically until, if they match, they appear as a single strand. At the bottom is shown the relative size of the threads without magnification.

AERONAUTICS

N. A. C. A. Laboratories Are Devoted to High Speed Planes

New Wing and Other Projects Are Designed To Make The 500- or 600-Mile-an-Hour Plane a Reality

JUST in case you do not believe this is a speed-mad age, come down to a unique aeronautical laboratory in Langley Field, Va., where the world is in a 600-mile-an-hour whirl.

You may wonder at the wisdom of going so fast, but it's exciting and breathtaking anyway—even to the skeptic who doesn't want to go from New York to Los Angeles in four and a half hours. It's 19 wind tunnels, a dozen laboratories. It's 200 engineers and almost as many research projects driving ever harder at catching up with the speed of sound.

As transatlantic cables flash word of new speed records and of military planes in Europe so fast they can almost race a rifle bullet, Langley Memorial Aeronautical Laboratory, Uncle Sam's little known air research center, is turning more and more of its attention to extreme high speed flight. Its engineers are verbally tossing hundreds of miles an hour around as never before.

The wing for a 500-mile-an-hour airplane, which will probably make its debut within two years, has already been

born there. Still more startling developments of a similar nature are on their way.

From the laboratory, operated by the National Advisory Committee for Aeronautics, have come in the past hundreds of developments that have boosted airplane speeds to their present level, and with them have come means for making airplanes safer and more reliable. But the public will be hearing less of the latter phases of the Committee's activities in the next few months as an air force expansion program preempts the attention of the scientists. They, more than anyone else in the United States, must see to it that this air force is based on knowledge that will make it better than any other in the world.

A few years ago the famous N.A.C.A. cowling, to fit around projecting cylinders of air-cooled radial engines, was perfectly satisfactory for all existing planes. But within the last year the trend toward higher speeds has forced the laboratory scientists to redo the earlier job and produce a cowling suited for the speediest Army pursuit ships fitted with radial power plants.

Exact studies of costly flush riveting

have been worked out also, so that designers in the great aircraft plants may know how much additional speed can be gained. The speed-seeking N.A.C.A. scientists have even investigated the effect of seemingly slight surface irregularities on wings and found that smoothing them out adds to speed. The effects of different kinds of coating—bare, lacquered, painted—have also been studied with this same end in mind: hatching in five or six years' time the 600-mile-an-hour airplane. Because, even if a ten-mile-a-minute clip seems a little fast to you and me, it isn't to the men piloting America's national defense on the Front Aloft.

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PHYSICS

G-Men Fight Crime With Powerful New Microscope

NEWEST weapon of the G-men against crime is a specially built precision microscope so powerful it makes a split human hair look as large as a piece of government red tape.

With the new instrument, described by E. P. Coffey, chief of the FBI's Technical Laboratory, speaking before the New York Microscopical Society, a single hair from the clutched hand of a victim can be compared in magnified form with the hair from the head of the suspect. The two can be blended optically until, if they match, they will appear to the eye at the instrument as if they were a single hair. Color is revealed in tiny threads so small that they appear colorless to the unaided eye.

Human and animal hairs can be cut either lengthwise or crosswise and the sections studied for comparison of individual cells. The magnification of this instrument is much greater than that of the comparison microscope already in use for matching bullets. This new microscope magnifies 1125 times.

A new microchemistry laboratory at FBI headquarters, where instruments, beakers, scales, and so on are on a doll-house scale, was also revealed by Mr. Coffey. In this laboratory a tiny fleck of blood from a stained bit of clothing can be analyzed to determine what animal it came from and, if human, even the blood group of the victim.

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A Stone Age woman whose skeleton was found in the Crimean Peninsula had the end joints of the little fingers cut off—a custom known in recent times among primitives.