



**FASTER READING**—First step is a film record made of the eyes with the ophthalmograph in the Pentagon's Reading Improvement Laboratory. Maj-Gen. Kenneth P. McNaughton's eyes are photographed by the instrument, as it is adjusted by Staff Sergeant Thomas J. Smith. Film record (left) made by the ophthalmograph reveals the number of stops or fixations made by the eyes in reading lines of type.

## PSYCHOLOGY

## Improve Reading Speed

Air Force officers are being trained in a special laboratory course to read 50% to 60% faster. This is done by increasing the span of what the eye takes in.

►THE same technique used during the war to teach aviation personnel to spot and recognize aircraft at the flit of a glance is now being used to train Air Force officers to speed up their reading.

The officers, including generals, are taking turns going to classes in a Reading Improvement Laboratory under the direction of Major B. E. Prater.

After six weeks spent in the Laboratory, the officers find that they can read on the average from 50% to 60% faster than when they entered. They can then go through their mountains of "paper work" much faster.

First step, when an officer goes to the Laboratory, is to photograph his eyes while reading. This is done with a scientific instrument called the ophthalmograph. The film record made by this instrument shows the number of stops made by the eyes in reading a line of type, and the number of times the eyes backtrack to re-read a diffi-

cult word or phrase. It shows up irregularities in rhythm of eye movements.

Basic to the new technique of reading training is a scheme for increasing the span of what the eye takes in at a single glance and the shortening of the time required for that glance. For this the tachistoscope is used. This machine flashes slides onto a projection screen.

At first, the machine is set so that each slide is seen for 1/25 of a second, the length of the shutter click when you are taking a snapshot with your box camera. Later the time is cut to 1/100 of a second. At the beginning of practice the slides contain numbers of five digits. The reader is soon able to recognize any of these numbers in 1/25 or even 1/100 second.

But the idea is to train the eye to cover a greater span in the same brief instant. So he next tries six-digit numbers and gradually works up to seven- eight- and even possibly nine-digit numbers.

This technique was worked out by Dr. Samuel Renshaw at Ohio State University to train men in flash aircraft recognition.

While the reader is lengthening his eye span he is at the same time breaking up any faulty reading habits of pronouncing, either aloud or silently the individual digits—it just can't be done at that speed. You have to learn to recognize by sight alone.

This is what the fast reader must do with the printed page. He must take in a phrase as a whole and not pay attention to individual letters or syllables.

Officers in the Reading Improvement Laboratory spend 30 minutes a day with the tachistoscope. Work is individual; each one has his own tachistoscope and works at his own speed, improving at his own rate. For the next 30 minutes, they move to another room to practice with the reading rate controller. This is a machine developed by Dr. Guy T. Buswell at the University of Chicago. It is equipped with a metal screen that slides down the page of a book at a regular rate, covering up what the individual has already read.

Next step is to carry over the habits learned on machines to the day-by-day reading for work or pleasure. This the officer does by reading one page on the reading rate controller and then turning off the machine and reading the next page in the normal way.

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## CYTOLOGY

## Electron Microscope Aids Study of Genes

►GENES, the ultra-minute biochemical units that determine the course of heredity in man and other organisms, are moved one step closer to positive identification and detailed mapping by a new method of preparing chromosome-containing cell nuclei for electron microscope photography developed by a three-man research team.

Involving several steps of chemical preparation, the careful squeezing of the nuclei to spread the chromosomes, and preliminary examination under high-powered ordinary microscopic lenses, the new technique has been employed on immature human male sex cells, as well as on material from fruit-flies. An illustrated report of results is presented in SCIENCE (July 1).

A feature brought out by the electron microscope, never detected with even the highest powers of the ordinary microscope, is an ultra-fine web of connecting threads between the chromomeres or segments of individual chromosomes. Their significance has not yet been interpreted.

Participating in the research were Dr. Jack Schultz of the Institute for Cancer Research in Philadelphia, Dr. Robert C. MacDuffee of the Army Medical Center, Washington, D. C., and Dr. Thomas F. Anderson of the University of Pennsylvania.

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