

ing to be the scientists of the future.

Formal action along the lines suggested by Sir Henry has already been taken by the International Council of Scientific Unions, representing eight international science organizations. Dr. John A. Fleming of the Carnegie Institution of Washington told the meeting of an outline of action adopted by the Council at a general assembly in London last July. In summary, this calls upon scientific workers:

"To maintain a spirit of frankness, honesty, integrity and cooperation, and to work for international understanding;

"To promote the development of science in the way most beneficial to mankind and to exert their influence as far as possible to prevent its misuse, and

"To serve the community not only by their specialized work but by assisting as far as they are able in the education of the public in the purposes and achievements of science."

Science News Letter, November 2, 1946

the top of the letter and low frequency for the bottom of the letter. These sounds create the blind reader's sound picture of the letter.

Almost any printed or typewritten matter can be read with the instrument, contrasted with the limited number of works available in Braille for the blind today.

The electronic reading aid was developed under the Committee on Sensory Devices of the wartime Office of Scientific Research and Development. The committee is now with the National Academy of Sciences.

Science News Letter, November 2, 1946

ELECTRONICS

Blind Can Read by Ear

For persons without sight an electronic device translates letters into sounds, making it possible to "read" almost any printed matter.

► BLIND PERSONS can read by ear with a new electronic reading aid which converts printed letters into distinctive sounds for the sightless reader. The machine was demonstrated to the public for the first time at a session of the American Philosophical Society by its inventors, Dr. V. K. Zworykin, Russian-born director of electronics research at the Radio Corporation of America laboratories, Princeton, N. J., and L. E. Flory.

To read with the electronic device, the blind person scans the printed or typewritten page with a stylus that looks like a large black fountain pen. A small beam of light in the "point" of the stylus moves up and down on each letter, reflecting to a phototube that operates an amplifier tube.

A combination of five different sounds is produced for each letter as the stylus moves over the printed matter. The reader hears the "pips" through a hearing-aid-like ear attachment. Total weight of the electronic unit is only five and one-quarter pounds.

Dr. Zworykin disclosed that work is now underway on an instrument using the same principles to form the actual sound of each letter. This would spell out each word for the blind person as he scanned print with the stylus.

The electronic reading aid shown in Philadelphia requires the reader to learn a code of sounds for each letter. Blind persons in several laboratories are now being taught the new system experimentally, Dr. Zworykin reported, adding that the device is not yet being produced commercially.

Flashing the beam of light vertically up and down each letter, the stylus reflects the black area of the letter as distinguished from the white page. A frequency modulated audio oscillator uses the reflected light from the printed letter to produce high frequency "pips" at

ELECTRONICS

Electronic Tubes Speed Up Mathematical Calculations

► ELECTRONIC "super-brains" that will solve complex mathematical problems a million times faster than the best methods available ten years ago were forecast before the meeting of the National Academy of Sciences by Dr. John von Neumann of the Institute for Advanced Study, Princeton, N. J. This dizzying speed-up in calculating ma-



HEARING AID—Electronic device, developed in laboratories of the Radio Corporation of America, operates as a stylus on a printed page, translating letters into sounds.