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

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.

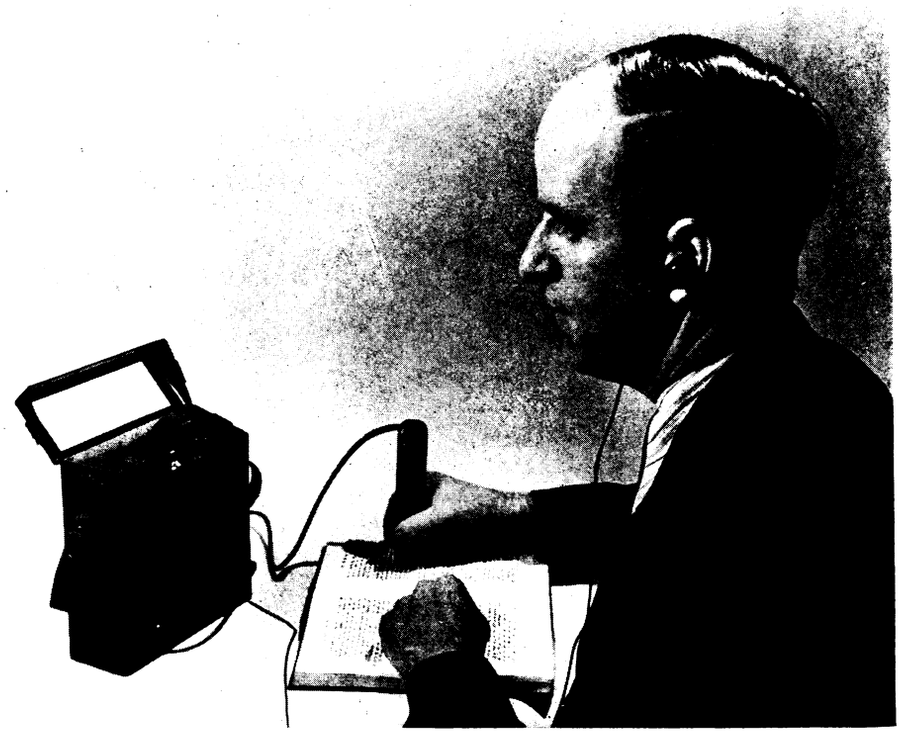
The electronic reading aid shown in Philadelphia requires the reader to learn a code of sounds for each letter. Blind persons in several laboratories are now being taught the new system experimentally, Dr. Zworykin reported, adding that the device is not yet being produced commercially.

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 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



***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.*

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-

chines will come through the substitution of electron tubes and electrical circuits for the cogs and gears of mechanical devices hitherto in use, he said.

New types of vacuum tubes, designed especially for these machines, are likely to be evolved, Dr. von Neumann predicted. Such special tubes will be needed especially for the parts of the machines that "remember" and carry over data for further operations.

The machines will require several thousand tubes each.

These electronic "super-brains" are, of course, unable to do any actual thinking. They accept problems at the hands of their human masters. But once a problem is set up they will simply run away with it, for they operate not with the speed of lightning but with the speed of light.

Science News Letter, November 2, 1946

PLANT PATHOLOGY

Alliance Wages Warfare On Stem Rust of Wheat

➤ CANADA, the United States and Mexico have found it necessary to form a three-power alliance in an unending war against a sub-human enemy, the black stem rust disease of wheat, Prof. E. C. Stakman, University of Minnesota plant pathologist, told the meeting of the National Academy of Sciences.

This is because the greatest wheat-growing area of the three countries is itself international. It starts in the northern states of Mexico, runs up the map of the United States in a wide zone from Texas to Montana and the Dakotas, and extends far up into the prairie provinces of Canada. An epidemic of wheat rust can get started in Mexico, become airborne through its billions of spores, and wind up by plaguing farmers in Saskatchewan. Under other circumstances, the spores may fly with the wind from north to south.

Plant breeders are constantly at work to produce new rust-resistant varieties of wheat, but their efforts are often set at naught by the wheat rust fungus, which is constantly evolving new strains, some of which are able to attack previously resistant wheat varieties. Hence it is necessary for wheat breeders and plant pathologists of the three countries to be constantly in touch with each other, exchanging information on the movements of the enemy and sharing their means for saving the wheat.

Science News Letter, November 2, 1946

BACTERIOLOGY

Disease Spread Studied

Germ warfare equipment and techniques developed during the war will be used to study transmission of disease germs through the air.

➤ EQUIPMENT developed during the war to handle the deadly "bugs" of bacteriological warfare has provided science for the first time with the means for studying the airborne transmission of the world's greatest scourges.

With the airtight chambers and elaborate equipment for washing "bugs" out of the air, University of California and Navy scientists have started a new approach to the study of such diseases as bubonic plague, influenza, psittacosis, and streptococcus infections such as rheumatic and scarlet fevers.

"We have a unique opportunity, with the war-developed equipment, to study airborne diseases under conditions which would have been impossible before the war," Dr. A. P. Krueger, leader of the new research program, says.

"The study of the transmission of these infections by air has been impossible because equipment did not exist which would eliminate the serious dangers to research personnel.

"During the war we had to develop equipment for safe handling of dangerous infectious agents, and this has opened up a new field of great promise to medical science."

The University of California laboratories for airborne research were developed during the war when Prof. Krueger, as a captain in the Navy, led a group of scientists in the development of bacteriological warfare techniques.

To prevent infection of the researchers, experimental animals are handled in airtight chambers similar to those used in handling plutonium. Manipulation of animals and equipment is done with long rubber gloves which are sealed into holes in the chambers, a glass plate giving good visibility.

All air in the laboratories is washed through a bank of precipitrons, which separate all the "bugs" from the air, after which the air is passed over a bank of ultraviolet lights to kill any remaining disease agents. Any air which is suspect is burned in gas.

The isolation apparatus is of the type developed at the University of Notre Dame by Prof. James A. Reyniers, who served in California as an officer in the Navy during the war.

Science News Letter, November 2, 1946

AERONAUTICS

Pressure Pattern Flying

➤ A NEW technique, "pressure pattern flying," is now available to air pilots on the Atlantic route from Europe. It depends upon weather reports received from planes on the route, which are compiled and rebroadcast from New York to all craft in the air.

These radio reports from the pilots, digested and edited by personnel of the U. S. Weather Bureau, are broadcast from station WSY, operated by the U. S. Civil Aeronautics Administration. The service has just been put into operation by the CAA. It comes as a result of a request from the Meteorological Committee of the Air Transport Association of America.

This new technique consists in determining the shortest flight-time path to the destination by a series of late accurate reports from other pilots flying the route which locates pressure areas and enables a pilot to take advantage of the airflow circling around them.

The principle of this technique is not entirely new. It has been experimented with by the Army and Navy air forces, and by several airline companies. The new broadcast over WSY, however, marks the first time that weather information from other craft has been collected and rebroadcast for this purpose.

Pressure pattern flying is considered advisable only for long overseas or transcontinental flights. The present service covers only about 800 miles on the trans-Atlantic route, but additional frequencies are being studied to give coverage over the entire distance.

Science News Letter, November 2, 1946