

ican who praises the individual but disparages the Soviet system gives serious offense to his Russian friend.

Russians have a high regard for technology, science and intellectual achieve-

ment in general. For this reason, probably the best emissaries for promoting good-will between the two nations are the scientists and engineers.

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## PHYSICS

## Sensory Aid for Blind

**Will permit its user to locate all obstacles within a radius of 20 feet by using a photoelectric cell and a beam of light.**

► **SUPLANTING** the blind man's white cane and seeing-eye dog, a sensory aid device, under development by the Army Signal Corps for six months, will permit its user to locate all obstacles within a radius of 20 feet by means of a photoelectric cell and a beam of light, it was announced by Maj. Gen. Harry C. Ingles, chief signal officer of the Army.

At present not sufficiently perfected for practical use, a nine-pound experimental model, turned slowly from side to side in the path of the user, detects objects within a 20-foot range and conveys the distance in a coded tone signal by means of an earphone to the user.

Designed by Lawrence Cranberg, physicist, the experimental model's three-watt lamp beams a narrow finger of light through a focusing lens in the front of the case, in a ray about two inches in diameter. Upon striking an object, the ray is reflected back through a second lens in the front of the case, which re-focuses the beam in a tiny point of light to the receiving unit, consisting of a revolving disk mounted in front of the photoelectric cell. The disk is divided into five concentric rings, containing one or more holes to permit the ray of light to strike the photoelectric cell. The angle of the reflected beam, changing with the distance of the object from the device, strikes the inner concentric ring of the disk at the maximum range of 20 feet, and moves downward on the disk as the object nears. The inner ring contains only one small hole, and as the disk moves at the rate of one revolution per second, the light would strike the photoelectric cell for an extremely brief period of time in each revolution. The energy, created by the photoelectric cell as the light reaches it, is relayed to the earphone by a standard commercial hearing aid, giving the code tone. An object five feet distant would reflect the ray of light to the fourth concentric

ring, which has one small and one large hole, giving a signal of one long and one short tone, as in the dot-and-dash of the Morse code.

The five rings indicate approximate distances of three, five, eight, 11 and 20 feet from the user to the object. With practice a blind person could determine exact distances by the overlapping of the signals as the light strikes areas between the rings.

The problem of filtering out disturbing signals from sunlight and ordinary electric lights was solved by an amplifying system sensitive only to modulated or "pulsed" light, and then modulating the light ray to that frequency.

Further development programs in supersonic and radar waves are also being conducted by the Signal Corps.

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## ORNITHOLOGY

## British Radar Clocks Invisible Flying Geese

► **WILD GEESE** flying at night have been tracked by radar operators on the eastern coast of England, so accurately that their ground speed could be measured, it is reported by David Lack and G. C. Varley of the Army Operational Research Group, Ministry of Supply, (*Nature*, Oct. 13). Radar pick-ups of bird flocks were made as early as 1941, and similar occurrences have been reported from other countries, including the United States; but it is only now that wartime restrictions on publication of the information have been lifted.

Longest radar track on a flock of geese thus far recorded was one made by a station of the R.A.F. on the coast of East Anglia. The birds were kept in the radar field for 99 minutes, during which time they flew 57 miles—an average of 35 miles an hour. Another station picked up the same flock and tracked them for an additional 22 miles,

at a ground speed of 33 miles an hour. The geese were never seen, but when they crossed the coast near a Royal Observer Corps post they were identified by their call as gray geese.

Gulls as well as geese have been picked up by radar, and even small birds traveling in flocks. Experimental proof that birds actually do produce radar echoes was produced by suspending a dead gull beneath a balloon and "radaring" this known target. The echo from the bird's body could be clearly distinguished from that produced by the balloon.

When approaching flocks of birds were first detected by radar it created some confusion, but this did not last long because of the great difference in speed between even the fastest of birds and the slowest of airplanes. Birds continued to create some disturbance, however, because their speed is close to that of fast surface craft. During the war, birds gave rise to several E-boat scares and to at least one invasion alarm.

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## PHYSICS

## Nazis Used Infra-Red Rays To Detect Fighting Tanks

► **INFRA-RED** rays were used by the Germans during the latter days of the war to detect Allied fighting tanks at night, it is now revealed. Since infra-red rays are not visible to the human eye, the Allied tankmen did not know they were being illuminated.

This is one of the startling advances made by German scientists that might have prolonged the war if the Nazis had been able to hold out a few months longer, according to Dr. Charles F. Green, of the General Electric Company, who recently returned from Germany where he served on an Army mission.

The infra-red rays were the results of infra-red filters positioned on German searchlights. If these filtered searchlight beams hit the Allied tanks, they bounced back to devices known as "bildwandlers," or "image changers," mounted on German tanks. These devices transformed the infra-red rays into an image of the opposing tank, Dr. Green states, and the gunners opened fire.

Research in German laboratories, and the use of that knowledge in making armaments, according to Dr. Green, were coming ahead so fast at the end of the war that the Allies' margin of superiority was rapidly decreasing.

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