SCIENCE NEWS

Science Service, Washington, D. C.

THE SOLAR ECLIPSE

EVEN though they chose a location in a very dry as well as high region of South America, where the chances for good weather seemed extremely favorable, cloudy weather curtailed the observations of the joint expedition to Patos, Brazil, of the National Bureau of Standards and the National Geographic Society, to observe the total solar eclipse visible on October 1.

A report received from Dr. Irvine C. Gardner, leader of the party, says that the eclipse itself was eclipsed by the clouds. Thus, the elaborate equipment, weighing about seven and a half tons, which they transported from Washington, was largely useless. No opportunity was given to try the control device, operated like an electric player piano, which had been arranged to operate the various cameras automatically, so as to give the astronomers the opportunity to watch the events in the sky.

This expedition, however, was better off than many others in the past, for which cloudy weather has meant complete failure to secure useful results. One of the main items on the program was a study of the way that the transmission of radio waves through the upper layers of the atmosphere is changed as the moon's shadow goes by. This is unaffected by clouds, and these observations were made satisfactorily. The actual results will not be known until after careful study of the data. Hopes that at least one astronomical group had been successful were considerably lessened when word was received from Dr. Charles H. Smiley, of Brown University, that clouds over Curema, Brazil, had prevented his planned observation from that distant spot. He had planned to take photographs at Curema with a special type of star camera, known as a Schwarzchild telescope. With this he hoped to record the zodiacal light, a faint glow sometimes seen near the sun. Accompanying him was Dr. Alice Farnsworth, of Mount Holyoke College, who was to use other equipment, including a spectroscopic camera, for further observations. Dr. Smiley's report, which was delayed because of the remoteness of Curema, says that all the films were exposed, though he is certain they will be of little value.

No word had been received so far from the Cruft Laboratory of Harvard University concerning the expedition to Queenstown, South Africa, to make radio observations. The expedition, under the direction of Dr. J. A. Pierce, is now in the middle of a three-months' program to study the effect of the eclipse on radio transmission before, during and after the time the moon passed in front of the sun. Since this is unaffected by clouds, it is assumed that the observations were carried out as planned. A motion picture of the eclipse was planned, incidentally, mainly to give a record of the extent to which the moon covered the sun, for checking with the radio data. If this was taken, it may have considerable value as one of the few photographic records made of this eclipse.

There are, however, several large observatories in South Africa. It is quite likely that some members of their staffs made an effort to observe the eclipse, for it is hard to imagine an astronomer neglecting one so near home. On account of the war, it may be some time before news of any such results reaches the United States.

With the total eclipse of October 1 past, and observations, in South America at least, ruined by clouds, astronomers are turning to their reference works to see when they will have another chance. This will come on September 21, 1941, though plans are very uncertain, because the best place from which to see it will be on the coast of China, between Foochow and Wenchow, as well as farther inland, at Hankow and Nanchang. Whether foreign astronomers, especially Americans, will be able to set up their instruments there by next September is perhaps rather questionable.

The tip of the moon's shadow, on September 21, will first touch earth at sunrise in Russia near Astrakhan. Then it will cross the Caspian Sea, the Aral Sea, Turkestan, Tibet and China. After that it will pass across the western Pacific Ocean, including the American island of Guam. Here the sun will be blacked out for about two and a half minutes, or fifty seconds less than in China, but this would still give time for many valuable observations.

SUSCEPTIBILITY OF INFANTILE PARALYSIS

LARGE-SCALE tests of the population for susceptibility to infantile paralysis may soon get under way as a result of research, according to a report by Dr. Charles Armstrong, of the U. S. National Institute of Health, made at the meeting of the American Public Health Association at Detroit.

Dr. Armstrong's discovery that mice and cotton rats instead of the more expensive monkeys can be used for testing a person's immunity or lack of it to the disease would make such mass tests possible. Search for a possible chemical remedy will also be advanced through this discovery.

The still unsolved mystery of why older persons and those living in institutions generally develop resistance to infantile paralysis may be explained by making tests on large numbers of the population. With monkeys only a few immunity tests can be made because of the expense. The largest number made in one study with monkeys was about eighty, whereas Dr. Armstrong has already made 293 since discovering that cotton rats and mice can be used.

The test consists in mixing serum from the tested person's blood with infantile paralysis virus and injecting it into the rat or mouse or monkey. If the animal fails to get the disease, the person's blood contained virus-neutralizing material, indicating immunity to the disease. Heretofore only monkeys were used because no other animal had been found susceptible to the disease except man and monkeys.

Frequent tests of a group of people checked against

their histories of almost unnoticed illnesses such as slight colds, or of contacts with infantile paralysis patients would also shed light on the question of how and why some people acquire immunity or resistance to this disease while others do not.

If resistance is acquired through age alone, as has been suggested by recent experiments, and not by building up resistance through a sort of natural vaccination with small doses of the virus, the mouse or cotton rat tests might show the exact age at which immunity does develop. Then a study could be made of other changes occurring at an age which might carry with them ability to develop resistance to infantile paralysis and from this, possibly, develop a means of protecting against the disease at any age.—JANE STAFFORD.

ANTI-SYPHILIS LEAFLET

AS part of a new drive on syphilis and gonorrhea initiated by the U. S. Public Health Service, each of the 16,500,000 young men who register on October 16 for America's first peacetime draft will be given a leaflet urging that he take a blood test as part of an initial check on his physical fitness. Surgeon-General Thomas Parran pointed out that registrants for the draft make up the age group in which is concentrated most cases of infectious syphilis.

"Blood tests of this group," he said, "will lead to the discovery of a large number of cases of syphilis in the stage of the disease during which treatment is most effective. Stopping the spread of syphilis among this group would bring the control of syphilis among the whole population nearer by many years."

Making a blood test of each man as he registers was suggested at a conference of state health officers with the surgeon-general. This would be impractical with the available facilities. It would keep every laboratory in the country busy for a year testing the 16,500,000 samples of blood and satisfactory tests can not be made on blood after it has been kept for several months. The time is too short to prepare for such a speed-up in laboratory work as would be necessary, but it is hoped to achieve the same results through the leaflets telling each of the registrants the facts about syphilis and gonorrhea and their relation to national defense. Dr. Parran pointed out that "Men infected with syphilis or gonorrhea and untreated can not efficiently perform their duty of defending America. Discovery and treatment of syphilis among registrants *now* will increase the reservoir of men available for active and efficient duty in the armed forces and in industry. An educational campaign coordinated with an extensive blood-testing program will not only discover many hidden cases, but with the facts about syphilis in the hands of all young men between 21 and 36, we may expect a reduction in the number of new infections."

EYE TESTS IN THE INDUSTRIES

NEW eye tests to protect the vision and speed the efficiency of workers in defense and other industries were announced by Dr. Hedwig S. Kuhn, of Hammond, Ind., at the meeting in Cleveland of the American Academy of Ophthalmology and Otolaryngology.

The tests, a new instrument for giving some of them, and the idea that workers must be selected for jobs on the basis of their eyesight as well as other requirements developed from Dr. Kuhn's study of 16,000 workers in such diverse industries as "chemicals, big steel and little steel, soap, public utilities, textiles, tanks and even horse shoes."

This is apparently the first scientific study of the demands that modern machinery makes on the eyes of workers. Five groups of eye defects and their significance were discovered in studies of occupations in which the visual requirements differed markedly. At one extreme of those studied was a crane operator who needed to judge distances 150 feet away; at the other a "looper" in a hosiery factory whose pay envelope depended on her ability to do piece work 8 inches from her eyes.

"To find acuity defects and a lack of depth perception is of vital importance for crane operators, but of no special concern to manual labor," Dr. Kuhn pointed out. "A marked muscle imbalance in clerical workers has been shown to be detrimental to their comfort and efficiency, while an extremely careful study of the five defect groups is essential in choosing or analyzing girls in looping at a distance of 8 inches. For the purposes of industry this type of practical analysis is the basis for deciding where to begin a personnel program of shifting jobs, and an insistence on corrective measures."

PLASTICS

WITH the old supply of harmonicas from Germany, Italy and Czecho-Slovakia cut off by the war, a shortage of these instruments threatened, but now a molded plastic mouth organ has been made in the United States. It is one of nearly a thousand exhibits now on display at the Chanin Building, New York, which show the great variety of products made from synthetic materials. These exhibits have been entered in the Fifth Annual Modern Plastics Competition sponsored by the magazine, *Modern Plastics*.

Another novel application is a football helmet, with a molded plastic shell, lined with padding. It can be made in a great variety of colors and is said to afford more comfort, protection and a better appearance than the older type. Whether it will appear this autumn on the nation's gridirons may be determined after football experts have given it a test.

Women's shoes and raincoats are among the articles of clothing of plastic. For the former, the flexible plastic material is used mainly as a comfort-promoting and decorative feature, though its use later for soles is anticipated. Availability in clear, transparent form as well as in colors adapts it to open heel and toe models, where it gives protection without destroying the effect.

Porch and terrace furniture is shown, made of plastic strands, woven by hand or machine. Unlike rattan and wicker, this is unaffected by the elements, and does not unravel to make a rough surface, which may tear clothing. It can be washed with soap and water.

An important industrial application is a plastic solder paddle used in finishing automobile bodies. These are used to smooth the hot lead solder. The wooden paddles formerly used had to be replaced frequently. The plastic

paddles withstand the temperature of the molten lead, and have in their handles a fountain of oil, which can be released to assist in the smoothing operation.

Another industrial device is a brush used to convey dyes from shallow vats to engraved rolls which in turn print designs on fabric. Formerly, Mexican cactus fibers were used for the bristles, and the life of a brush ranged from two to eight weeks. Bristles of the new brushes are made from the same synthetic fiber that women have recently started to wear for stockings, and they have now been in operation for over eight months without a breakdown.

Boat owners will be interested in a bilge pump completely enclosed in a strong plastic housing. It has a sway-proof switch. Even though the boat is rolling, it stays on until the bilge is pumped dry.

In not all uses of plastics are they visible. Panels of plywood are shown in which the veneers are bound together by a synthetic resin. This is a bond that is unaffected by moisture, temperature, acids or insects.

LUMINOUS BRICKS

HOLLOW glass bricks for construction of houses and other buildings, which admit daylight during those hours, and glow at night when electricity is passed through them, may soon give architects an entirely new angle on illumination.

The luminous bricks, invented by Edward B. Baker, of Detroit, Mich., won for him patent No. 2,216,220, one of a total of 612 patents for new inventions granted this week. Rights have been assigned to the General Electric Company.

Many modern buildings have used glass bricks in recent years, but Mr. Baker's improvement is to fill them with a gas that becomes luminous when an electric current passes through them. He lists some advantages as follows:

"With a wall of this nature, the intensity of the light per unit of area is much lower than is the case with a few spaced light sources of high intensity and a closer approach to indirect illumination may be achieved. In a room having the walls built up in this fashion, an adequate quantity of light may be obtained without having any bright spots to produce an annoying glare. Moreover, when used as an outside wall, a room of this nature would be quite adequately illuminated during the day, due to the translucent nature of the wall. Another advantage of such a structure is that since the wall is itself luminous no separate light supporting devices need be provided. Moreover, since the internal pressure is quite low each of the individual blocks functions as a very good heat insulator."

In order to increase the illumination, he suggests that the inside of the bricks be coated with a material, like that used in the new fluorescent lighting units, which glows under the influence of the ultra-violet rays generated by the electrically excited gases. If ultra-violet rays are wanted in the room, as for sterilizing purposes, the brick can be made of a glass which transmits them, and a small amount of mercury placed inside the brick.

ITEMS

CONSTRUCTION of the sixteenth American cyclotron, powerful tool for the study of cores of atoms and the creation of radium-like substances artificially, is in progress at the University of Illinois. Six iron castings weighing 60 tons have been installed on a concrete base in the new Radiation Laboratory. On them has been placed two miles of copper tubing, wound into a dozen flat coils. The university already has a small cyclotron, second in the world, built soon after Dr. E. O. Lawrence made the first at the University of California. The new one will, it is said, "be roughly equivalent in results" to any of the others now in operation or being constructed in America.

IF you fix your eyes on a stationary point along the path of a speeding automobile, apparently you can see the spokes of the rapidly spinning wheels. But this effect is really an illusion. This was explained at the meeting of the Optical Society of America by William A. Gardner, of Columbia University, who has reproduced the effect by photography with a slow shutter speed. Actually, one does not see the spokes themselves but each spoke, as it turns over and moves forward at the same time, produces a broad, blurred curve. Where these curves have the greatest over-lap, a pattern of radial lines is formed which looks like the real spokes. This pattern glides across the retina of the eye or the film of the camera. A previous explanation of the effect has been a "stroboscopic" theory of vision, that the eye sees in instantaneous pulses somewhat like the successive pictures in a movie film. Mr. Gardner points out that his results, and the fact that he has photographed the effect, favor the alternate theory, that the sensitivity of the eye is continuous, like the camera film. There is a similar phenomenon, called the Roget effect after its discoverer, by which the spokes of a moving wheel appear curved when seen through a series of fixed vertical slits. Mr. Gardner has reproduced this photographically also.

KIWIS, wingless birds whose name is tossed as an epithet by aviators at the non-flying ground officers of their service, are now represented in a new exhibit at the Field Museum of Natural History, Chicago. The group shows a kiwi standing guard over two disproportionately large eggs in its nest under a cycad bush. The kiwi, a native of New Zealand, is one of the strangest-looking birds now living. Its wings have degenerated to mere internal nubbins of bone, its body is covered with long, fringy feathers that look almost like hair, and it has a long bill which it uses in probing for worms and in tapping, like a blind man, to guide it on its weak-sighted way. It is about the size of a hen, but its eggs are ten times the size of hens' eggs. They weigh a fourth as much as the bird that lays them. In the kiwi family, it is the female bird that rules the roost. The male, a third smaller than his mate, meekly sits on the eggs and broods the chicks. The hen takes over the defense of the nest if an intruder threatens. She kicks straight forward, like an ostrich, with her unfemininely large and strong feet, and since her toenails are hard and sharp she can inflict really nasty wounds.