SCIENCE NEWS

Science Service, Washington, D. C.

THE EXPECTED METEOR SHOWER

ASTRONOMERS are hoping that there will be an extraordinary display of shooting stars or meteors on October 9 or 10, although they are trying not to raise anticipation too much by making definite predictions.

Just six years ago, on October 9, 1933, there was visible in Europe for a few hours the strongest meteor shower of this century. It was one of those heavenly performances that one is lucky to see once in a lifetime. Astronomers figured out that the earth had passed through the region of space occupied 80 days previously by the faint, short-period comet Giacobini-Zinner. The meteors were produced by bits of débris tagging along in the same orbit as the comet. Since the period of this comet is 6.6 years, it is again due in the vicinity of the earth. This year the earth precedes the comet to the point where their paths cross by 136 days. In 1940 the earth follows the comet by 229 days. In either case there is a chance that there will be a recurrence of the Giacobinid meteor shower.

Dr. Fletcher Watson, of Harvard Observatory, finds that the earth reaches a favorable position for a shower on October 9 or 10, if the comet has not varied too much from its previous path, which it may have done. He suggests that observers over the whole earth be alert during those evenings so that any display of meteors can be properly recorded.

Any careful, observant person can make useful records. Here is how to go about it. Get out in the country where street and house light will not blind you for the majority of the meteors will be faint. Record the magnitude or identity of the faintest star you can see. If the transparency of the sky changes appreciably during the observations, record the changes. Watch some definite region of the sky, such as the polar region or the zenith, directly overhead. Count the number of meteors seen during intervals of five minutes. At least once each hour, over intervals of not less than five minutes, count the number of meteors of each magnitude. Determine as closely as possible the position and size of the area from which the meteors seem to come. If low-power binoculars are available make observations of the number of meteors of various magnitudes seen through them. Send in a full record of your observations to Science Service, Washington, D. C., for transmission to astronomers who will study them.

An extraordinary display of the Giacobinid meteors may occur in 1946 because then the earth and the comet are expected to be only eight days apart in reaching the same position. But astronomy has not yet lived down the failure of a much-heralded Leonid shower in 1899, which just didn't happen. For that reason, while hopeful, astronomers are not being dogmatic about the chances of seeing the Giacobinid shooting star shower, either this year, next year or in 1946.

RADIOACTIVE TRIPLE WEIGHT HYDROGEN

HYDROGEN of triple weight variety has been made radioactive in atomic bombardment experiments with the University of California cyclotron. It is a strange kind of hydrogen of mass 3 with a long half-life period of radioactivity and a very short range for the radiation given off from it.

Drs. Luis W. Alvarez and Robert Cornog obtained the evidence as a follow-up on atom-smashing experiments that showed an unusual kind of helium of mass 3 instead of the usual mass 4 is stable. The research also showed mass 3 helium to be about 12 times as plentiful in helium obtained from the atmosphere as in helium extracted from gas wells.

The helium of mass 3 when used as a bombarding material induced radioactivity in ordinary silicon of mass 28, probably forming phosphorus of mass 30 which broke down into silicon of mass 30 with release of electrons. The radioactive mass 3 hydrogen was produced by bombarding deuterium (hydrogen of mass 2) with deuterons (hearts of mass 2 hydrogen) by means of the cyclotron.

Ordinary hydrogen is the simplest element of unitary weight or mass one. It is one of the components of water and almost all living and many non-living things. Helium is the next heaviest element, usually of mass 4, and only in recent years has it been available in quantity for use in airships, diving and medicine. The report is published in the *Physical Review*.

AIR SANITATION

MEDICAL science may be on the verge of conquering epidemics of respiratory diseases, such as influenza, colds, etc., by keeping the air clean. Just as typhoid and other water-borne ills were brought under control by successful sanitary measures of control, so the next great advance in disease prevention may be air sanitation.

At the University of Pennsylvania Medical School there is in progress a special investigation of air-borne infections. One result is the idea that it is not alone the droplets sprayed in the air by coughs and sneezes that carry diseases, but the nuclei of the dried droplets that float in the air.

Respiratory infections are must less frequent in spring and summer than in winter because open windows change the air 100 times an hour compared with below 10 overturns per hour with the closed doors and windows of winter. If air disinfection in winter can accomplish similar hygienic results, a long step may be taken in air-borne disease control.

One of the most promising methods of air disinfection is through use of ultra-violet lamps that create invisible screens of radiation barring and wiping out the germ-laden bits floating in the air. Already used in hospitals to barricade sickrooms against release or entrance of infection, they promise to have wider use, even in homes and public places.—WATSON DAVIS.

HEARTWORM INFESTATION OF DOGS

A NEW drug to combat the rapidly spreading heartworm infestation of dogs will shortly be made available to veterinarians. The drug, antimonial-III catechol thio-

salicylic acid sodium, is the result of three years of intensive research by James A. Austin and Dr. Harold P. Brown, of Kansas City, Mo.

Heartworm infestation of the dog is a unique disease because living adult worms, *Dirofilaria immitis*, 8 to 12 inches long, situate themselves in the right heart. Under treatment the adult worms are slowly killed by gradually building up a concentration of trivalent antimony in the blood stream of the dog. The selective habitat of the adult worm in the right heart is a fortunate arrangement for the dog, for if the Dirofilaria were located in the left heart they would, upon being killed, pass into the aorta and its branches and the dog would succumb to a generalized embolism. Owing to the rich blood-supply of the lung, this organ is usually capable of coping successfully with the task of absorbing the dead filariae.

The ill effect of heartworm infestation upon the host is not entirely due to the presence of the adult worms in the heart. Larvae liberated into the blood stream also damage the dog. These larvae, or microfilariae, 0.2–0.3 millimeters in length, are worm-like in appearance, and move through the blood with a whipping motion.

One 27-pound dog with a fairly heavy infestation presented a count of 186,000 microfilariae per cubic centimeter of blood, or approximately 175,000,000 heartworm larvae in its entire blood stream. Laid end to end these microfilariae would stretch a distance of 30 miles. Upon autopsy, the right heart and pulmonary vessels were crammed full of the adult worms. A rough estimate of 100 adult worms would place the total length of worms in the heart and blood vessels at about 100 feet.

Heartworm infestation can not be transmitted directly from dog to dog, but must pass through an intermediate host. The mosquito has been indicted, and the tick, flea and other biting and sucking arthropods and insects are suspected. Treatment of the condition involves a series of graduated daily doses of the drug administered intravenously.

ITEMS

ENGLAND is investing nearly $30,000,000 in a new plant for the production of petroleum by the hydrogenation of coal, it has been learned by *Industrial and Engineering Chemistry*. The plant, the second to be built in Great Britain, is to be financed by government capital with the Imperial Chemical Industries, Ltd., the management corporation. The I. C. I. already operates the large coal-hydrogenation plant at Billingsham-on-Tee for the production of gasoline.

ALL medical officers of the British Royal Air Force have been instructed that no one should be allowed to fly or to drive an automobile while taking sufanilamide or related chemical remedies. Derivatives of these chemicals, by producing methemoglobin or sulfhemoglobin, may interfere with oxygen exchange of the blood and so prove a danger by reducing oxygen supply to the pilot's or driver's brain. Peace-time experience shows that a full dose of one of these sulfanilamide derivatives taken shortly before flying lowers an aviator's "ceiling" by about 5,000 feet. Dr. E. P. Mackie, medical adviser of Imperial Airways, saw a pilot who was suffering from severe oxygen lack as a result of flying at only 13,000 feet. Investigation showed he had been taking full doses of sulfanilamide for tonsillitis. Similar cases have been observed in America and Germany. The British experience is reported by a correspondent of the *Journal* of the American Medical Association.

RUST fungi, among the worst parasitic enemies of wheat and other grains, may possibly give their host plants something in exchange for what they take. Dr. Branquinho d'Oliveira, of the National Agronomic Station at Lisbon, reports in *Nature* the results of experiments suggesting that rusts can capture and fix nitrogen from the air, as do the bacteria that live in the roots of plants of the pea and clover family. Dr. d'Oliveira grew wheat seedlings on laboratory media from which all nitrogen had been carefully excluded, so that the customary supply of this vitally necessary element could not be obtained through the roots. Then he inoculated part of the plants with spores of various species of rust. After a time he analyzed the plants. The infected ones proved to have a slightly but definitely larger nitrogen content than the control plants that had grown up free from rust.

BENEFITS of protection to migrating hawks and other useful birds of prey at Pennsylvania's famous Hawk Mountain are shown in the first annual report of the association formed to acquire and develop the critical two square miles of crest land, where gunners used to station themselves to shoot the birds "just for fun." Although the Hawk Mountain Sanctuary Association has been functioning officially for only one year, close counts on the migrating hawks and eagles have been kept up since 1934. They show fluctuations in numbers of particular species, but the net totals have climbed from 10,776 in 1934 to 17,024 in 1938. (The 1939 migration has not yet taken place.) The biggest increase has been in numbers of the broad-winged hawk, which preys chiefly on rodents, reptiles and amphibians. In 1934, 2,026 of this species were counted at Hawk Mountain; the 1938 count was 10,761. Hawks and eagles in general are useful birds, destroyers of rodents and other vermin, explains Mrs. C. N. Edge, through whose activity the sanctuary was established. Only a few species are chicken thieves and hunters of the game birds which man considers his especial prerogative.

AMERICAN chemists now have ready more than 500 dyes for tinting the new Nylon stockings, made from coal, air and water, which soon will be on the market, according to the report of P. H. Stott, du Pont chemist, to the meeting of the American Association of Textile Chemists and Colorists. Originally created for use on wool, silk and acetate rayons, the dyes work equally well on the new synthetic, silk-like fiber. The introduction of Nylon and its dyeing, Mr. Stott indicated, is in sharp contrast to the struggles of the then-new rayon industry during the World War. At that time the industry was completely dependent on German dye imports and had difficulty in getting good dyes after the conflict began.