SCIENCE NEWS

Science Service, Washington, D. C.

COSMIC RAYS

COSMIC rays, the invisible visitants from outer space that have been interpreted by Dr. R. A. Millikan as heralds of the creation of matter out of errant energy, do not come as steady, undulating streams after the manner of the older concept of light rays, but as separate, high-velocity particles, like tiny bullets.

This concept of the nature of cosmic rays has received support from the work of Dr. L. F. Curtiss, of the U. S. Bureau of Standards, who described his results before the recent meeting of the American Physical Society at Washington.

Dr. Curtiss placed two electron counters, instruments adapted for the detection of the swift passage of these almost infinitely small, electric particles, one above the other. Between the two he inserted the poles of a powerful electromagnet. It has long been known that electrons and other electrically charged particles can be pulled from their course by a magnetic field, and Dr. Curtiss reasoned that if the cosmic rays were corpuscular in their nature he should be able to deflect them after they had struck and registered in the first electron counter, and before they had made contact with the second.

This occurred: When the electromagnet was not in operation, the two electron counters would frequently register at practically the same instant. This was taken to indicate the impact of the same particle, as it passed through the two instruments successively. This interpretation was first applied by two German workers, Walther Bothe and Werner Kolhörster, the latter one of the pioneers of cosmic ray research.

But when Dr. Curtiss turned on the current in his electromagnet, the number of simultaneous registrations by his two electron counters was materially reduced, thus constituting a demonstration of the existence of a corpuscular radiation of very high energy.

THE BAER TREATMENT OF OSTEOMYELITIS

MOUNT ALTO VETERANS' HOSPITAL is to be made a training center for Veterans' Bureau hospital physicians learning the Baer method of treating the dangerous bone disease, osteomyelitis, with maggots, tiny larvae of flies.

Representative Royal C. Johnson, of South Dakota, who is chairman of the Veterans' Committee of the House, recently arranged for Dr. William S. Baer, clinical professor of orthopedic surgery at the Johns Hopkins University, together with his assistant, Dr. S. K. Livingston, to give a lecture with slides and demonstrations on his treatment before all members of the House Veterans' Committee.

Because doctors must be well trained before they go out to the hospitals and introduce this treatment, it was thought that the best plan was to make the Mount Alto Hospital a training center for doctors to learn the work at first hand. Mount Alto is staffed largely by Johns Hopkins men.

Appropriately enough the new method, which is to be used to treat the thousands of veterans suffering from this bone disease as soon as their physicians and surgeons can learn its technique, was developed as a result of observations made on wounded men during the war. Dr. Baer was then chief surgeon of the orthopedic section of the medical corps of the second army.

Treating the wounded as they came into the hospitals, he noticed that those who had been lying out on the fields for hours were brought in with their wounds covered by the tiny crawling maggots, the larvae from which common flies develop. But these men, strangely enough, did not develop infections in their wounds, as did those whose wounds had been dressed and treated very soon after their infliction.

After the war, Dr. Baer remembered the maggots when he was treating children suffering from osteomyelitis. This disease is an inflammation of the bone, more common in children than in adults. It is the result of an infection and requires prompt surgical treatment. It is also frequent in soldiers following wounds in which the bony tissue has been injured. Recovery is often delayed for years if the disease reaches the chronic stage. Dr. Baer remembered the maggots on the soldiers whose wounds healed quickly, and he remembered that the healers of ancient times had written that maggots should be used to clean up wounds of patients whose bones had been broken. He then started careful, scientific investigations.

The action of the maggots, Dr. Baer found, is to eat the dead tissues, bone and flesh, of the wounds and thus to destroy the material that would otherwise furnish good breeding ground for bacteria. The bacteria which might have entered a wound and set up an infection were unable to exist in the wound scavenged by the maggots.

The investigations had a number of setbacks. During the first winter, the supply of maggots gave out abruptly when cold weather killed the flies, and more had to be brought hurriedly from warmer cities than Baltimore. Then Dr. Baer started breeding maggots, so as to have a constant supply available. It was then found that the maggots occasionally caused fresh infection in the wounds. Much alarmed, Dr. Baer and associates attacked this new problem and soon found a way to breed maggots free from germs that could not possibly cause infection.

GROWTH PROMOTION AND INHIBITION

A THEORY of growth promotion and inhibition by means of organic sulfur compounds was explained before the Philadelphia meeting of the American Philosophical Society by Dr. Frederick S. Hammett, of the Lankenau Hospital.

In connection with his work on cell multiplication Dr. Hammett found the stimulus to cell division in the chemical group known as sulfhydril, consisting of one atom of

sulfur and one of hydrogen, which attaches itself to a large variety of chemical bases, including many organic and living compounds. By applying various substances containing this sulfhydril group he succeeded in stimulating growth in various plant and animal tissues.

A practical application of this discovery has already been made in the medical field, Dr. Hammett stated. One of his colleagues has tried a sulfhydril compound on obstinate open wounds and sores of various types, and the resulting rapid growth of new tissue has brought about the cure of a number of long-standing cases.

After he had satisfied himself that growth by cell multiplication is stimulated by sulfhydril, Dr. Hammett undertook to find out why such growth is checked under natural conditions. Since oxidation processes go on rapidly in growing tissues, it seemed natural to infer that the sulfhydril compounds were oxidized, and that as they added more and more oxygen to themselves they lost the power to stimulate cell division. He applied various partly-oxidized sulfur compounds to growing plant and animal tissues, as he had originally applied sulfhydril compounds, and found that the oxidized substances did cause a slowing down of growth. His successful experiments on the mouse tumors followed.

THE STUDY OF SOUTH AMERICAN INDIANS

A STUDY of the many Amerind peoples who once possessed the two western continents is necessary if we are to understand the history, economic development or present psychology of the Latin-American nations to the south of us. This was the thesis advanced at the meeting of the American Philosophical Society on April 24, by Dr. A. V. Kidder, of the Carnegie Institution of Washington. We have not realized the importance and value of understanding Indians, he said, because in the development of the United States the original possessors of the land were simply swept aside and did not become a factor of much real significance.

But in the Latin-American countries, where the Indians still form a large proportion of the population, and where even the upper classes often have a considerable amalgam of Indian blood, one can not expect to gain an intelligent knowledge of the land without studying the history of the Indian in all its phases. Progress in the study of man has been slow because of the vastness of the subject, and also because its difficulties have not been frankly faced and cooperative investigations, upon which ultimate success presumably must depend, have seldom been undertaken.

Dr. Kidder pointed to the work of the Carnegie Institution of Washington and associated agencies in Yucatan as an example of success in such a cooperative anthropological and archeological enterprise.

"The chosen field is small," he said, "it is representative, it offers problems of world-wide and age-long significance. Work in Yucatan is to be prosecuted by specialists, but close touch is to be kept between the groups, with a view to the pooling of resources, the formulation of, and the planning of ultimate attacks upon problems which are too large for the present methodologic weapons of any one discipline, but which are of fundamental interest for all disciplines."

THE ECLIPSE OF 1932

AMERICANS who missed the eclipse of the sun in California on April 28 will only have to wait a few years—until the afternoon of August 31, 1932, for another. Then a total eclipse will be visible along a path about a hundred miles wide, crossing northeastern Vermont, all of New Hampshire but the southwestern corner, southwestern Maine, Cape Cod and the northeastern corner of Massachusetts in the vicinity of Gloucester.

This will be much better astronomically than the eclipse of April 28, for it will last more than a minute and a half, instead of the second and a half this month. The path will be wide enough so that astronomers will have no anxiety lest they miss it. Already Dr. Frederick Slocum, of the Van Vleck Observatory of Wesleyan University, has made a study of weather conditions at this time of year, and finds that the interior of Maine, at such places as Hiram, East Baldwin and West Buxton, offers some of the best chances. Probably these towns will be a mecca for the world's astronomers at that time, for the International Astronomical Union will hold its first American meeting immediately afterwards. In fact, the meeting would ordinarily have been held in 1931, but was postponed for a year in order to permit astronomers from foreign lands to combine the eclipse and the meeting.

However, some American astronomers will have a chance to see an eclipse of the sun without waiting for two years. On October 21 of this year a path of totality will cross the south Pacific. A tiny island, Niuafou, in the Tonga group, is the only accessible land on the path. Dr. S. A. Mitchell, of the University of Virginia, a veteran eclipse observer, will head an expedition there under the sponsorship of the U. S. Naval Observatory.

After 1932, the next eclipse seen in the United States is on August 9, 1945, but it will only be visible at sunrise in Montana. Thence it travels northeastward across Canada, where astronomers may observe it. In 1954, on June 30, one begins in Nebraska, and travels to the northeast over Lake Superior, the southern end of Hudson Bay and Labrador. Probably this will be well observed. On March 7, 1970, one crosses central Florida. As this is near the middle of the path, there will probably be a number of astronomers watching it.

May 30, 1984, brings another central eclipse, like the one this month, but the total part of the path is longer and wider. Then the total eclipse will be visible along a path crossing Mexico and the southeastern states, going to sea near Maryland.

On May 10, 1994, an annular eclipse will cross the entire country from California to Maine, though as the moon will not completely conceal the bright solar disc, but will leave a ring of light around it, astronomers will probably not give it much attention. It will, however, be an interesting spectacle. In 2012 another annular

eclipse occurs on May 20, visible along a path from California to Texas.

The year 2017 brings one of the best American eclipses in the coming century, for then the path of totality sweeps squarely across the country from California to North Carolina. This occurs on August 21, and the path will probably be dotted with the super telescopes that astronomers of that distant date will enjoy.

Another annular eclipse, on October 14, 2023, visible along a band across southern California, completes the American eclipses of the coming century.

THE RECENT TYPHOON IN THE PHILIPPINES

A TYPHOON such as that which struck 14 towns on the Island of Leyte, of the Philippines, on April 18, destroying the homes of thousands and apparently killing many, according to first meager reports, would do but little damage in the United States.

In fact, typhoons have struck the United States, for the typhoon and the hurricane are exactly the same except in name. An average of five hurricanes a year sweep from their birthplace in the doldrums of the tropical Atlantic toward the southeastern and Gulf States.

From such storms America is protected as the Orient will not be for years, because of the stable character of the buildings in this country. The typhoon reaps a huge harvest of dead among the inhabitants of the frail houseboats which swarm together in floating cities.

Then there are many lines of communication in America by which warnings and news can be sent and relief rushed to the stricken area before disease has a chance to take a foothold. But even if the Far East had all these advantages, the loss of life would be great merely because the population is so dense and there are so many people to strike in any area.

There was evidence of a disturbance between the Island of Guam and the Philippines as early as Monday of last week, according to the U. S. Weather Bureau. But the typhoon was quite unexpected, as few occur at this time of the year. August, September and October bring the majority of these storms in the Orient.

The region west of Guam is a part of the birthplace of most of the typhoons. It is the doldrums of the Pacific, a calm area of hot, humid atmosphere. Here heated air rises through cooler and heavier layers and sets up the initial whirl. The storm then moves off, gathering volume as it goes.

It is an extensive disturbance, often hundreds of miles in diameter, and has a dead area with practically no wind in its center, while beyond velocities as great as 130 miles an hour have been measured. The typhoon center travels about 10 or 15 miles an hour over most of its course. It holds to practically the same course for days, but is hard to predict because it comes from an unfrequented part of the ocean.

A typhoon brought the heaviest one-day rainfall ever recorded. At Baguio, the summer capital of the Philippines, 46 inches fell in 24 hours on July 14–15, 1911.

ITEMS

IF you get stronger radio reception from a station northwest of you it is likely to rain next day. If the reception is weaker than average, it is a sign of fair weather, according to a paper read before the meeting of the American Physical Society by Professor R. C. Colwell, of the University of West Virginia. Listening to station KDKA, Pittsburgh, night after night at his set at Morgantown, West Virginia, Professor Colwell noticed that whenever there was an area of low atmospheric pressure, presaging a storm, between the two cities, the strength of the signals was increased. When a high pressure area moved in, bringing fair weather in its train, the signal strength decreased. If the low pressure area passed to the south of Morgantown, instead of going between the two cities, the signal strength remained unchanged, and so could not be used for weather prognostication.

PURE water, containing no mineral salts in solution, transmits ultra-violet light fairly well. But, according to Dr. Charles D. Hodgman, of the Case School of Applied Science, Cleveland, Ohio, who spoke at the Washington meeting of the American Physical Society, a little dissolved mineral makes a thin layer of water much less transparent to these invisible radiations. He found that a layer less than an inch thick of common lake water, taken from Lake Erie, and containing no more mineral than most city water, stops about a quarter of the longer-wave ultra-violet rays and nearly nine tenths of the short-wave rays.

RIBBED photographic film, such as amateur movie makers use when they take movies in color, was suggested as a means of making still photographs in color by Dr. Herbert E. Ives, physicist of the Bell Telephone Laboratories, speaking before the American Philosophical Society. Dr. Ives pointed out that this was really a revival of an instrument invented by his father, Frederic E. Ives, called the chromolinoscope, in which a separate screen of tiny ridges separated the light from a lens divided into three parts by three different-colored filters. This method was applied for amateur color movies by impressing the ridges on the film itself. Dr. Ives also suggested a means of copying such pictures in color, by photographing them with similar ridged film, but with the ridges running at right angles to those in the negative, thus avoiding troublesome "moire" effects.

BLASTING their way through ledge rock, 115 feet deep at the thickest point, engineers have recently converted the 1,316-foot Ona tunnel on the Chesapeake and Ohio Railway nine miles east of Huntington, W. Va., into an open cut with little interference to the passage of the 75 daily trains. A false wooden tunnel within the concrete one torn down protected traffic from overhead blasting and made this feat possible. As the excavators reached the concrete they tore it away, leaving the frame structure intact. Then, after the cut had been widened to 70 feet at the bottom, trains were routed over a temporary track and the wooden shell was dismantled.