SCIENCE NEWS

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THE PERSEID SHOWER OF METEORS

WATCH the northeastern sky Saturday night, August 11, and even into the early morning hours of Sunday. Then you will be rewarded by a sight of some of the meteors, or "shooting stars," of the famous Perseid shower.

But though it is called a "shower" one should not expect anything approaching a shower of rain. True, there have been showers of meteors in the past, when the entire sky has been covered with thousands of them, like the ribs of a gigantic umbrella. Such a shower is very rare, and no one can tell when one will again occur.

On almost any clear night a careful watcher can probably see half a dozen meteors flash across the sky in the course of an hour. At the time of the Perseids, however, this number may greatly increase, so that one can easily see an average of one a minute or even more. This month they will be easily visible because the moon will be out of the way, and Saturday night will be dark. When there is a full moon in the sky at the time of the shower, its brilliance, while not making the meteors completely invisible, at least makes them less conspicuous.

The name of the Perseid shower comes from the location of what astronomers call the radiant. That is, the ordinary casual meteors that one sees on any night may float across the sky in any direction. The meteors of a shower, however, all seem to radiate from a particular part of the sky. In the case of the August shower, the radiant, or point from which they seem to come, is in the constellation of Perseus, which can be seen high in the northeastern sky after midnight.

Actually, the meteors are not coming from a point. They are moving in parallel paths. In the distance these paths seem to come together, in the same way that the tracks of a railroad seem to come to a point in the distance, even though they are actually the same distance apart at all places.

These meteors travel around the sun in a huge swarm. Probably all parts of this path along which they travel are densely populated with them, but some parts more than others. In August, the earth, in its own travels around the sun, crosses the path of the meteors. Then they fall into the earth's atmosphere, but the friction generated by the friction with the air soon burns them up in a flash of light that we may see. When the earth happens to cross the meteoric orbit at the same time as one of the very dense accumulations, they are unusually numerous, and a shower such as that of some past years is the result.

One thing about the study of meteors that makes it of interest is that it is one of the few branches of astronomy in which serious study can be made without the aid of a telescope. Under the guidance of Professor Charles P. Olivier, of the Flower Observatory, of the University of Pennsylvania, at Philadelphia, hundreds of these amateur astronomers report regularly on the meteors they observe. They are gathered together into an organization called the American Meteor Society. As there are many parts of the country where none of their members are located, Professor Olivier is anxious to receive more reports from these volunteer observers.

SPECTRUM OF THE NORTHERN LIGHTS

PHOTOGRAPHS made at the Lowell Observatory of the spectrum of the Northern Lights at the time of the brilliant display on July 7 has opened up a new scientific mystery. For the first time, there appears, in addition to the various lines due to known elements, a very prominent line in the red region of the spectrum. As it has never before been photographed, Dr. V. M. Slipher, director of the observatory, who recorded it, is unable to state definitely what elements cause the reddish color. However, he suspects that it is due to some known gas in the atmosphere of the earth, possibly nitrogen.

On the photographs taken by Dr. Slipher there also appeared very prominently the so-called green auroral line, which was long a mystery. First photographed during visible displays of the northern lights, or aurora borealis, it was found at the Lowell Observatory in 1915 that it could be recorded by pointing a spectrographic camera at any part of the sky on any night even if cloudy. Dr. Slipher has also made such photographs of it on numerous occasions and under all sorts of sky conditions, always with success. He finds an unaccountable variation of its intensity shown even in a few minutes. This may occur during a night that remains constantly clear, so is not due to the weather conditions.

However, the origin of the green line was shown a few years ago by Professor J. C. McLennan, of the University of Toronto, and Professor G. M. Shrum, of the University of British Columbia. Studies made in his laboratory with the aid of low temperatures obtained with liquid air and liquid hydrogen, finally demonstrated that it was due to familiar oxygen.

ANCIENT HUMAN REMAINS IN NEW MEXICO

RELICS of a buffalo hunt held by primitive men near Folsom, New Mexico, thousands of years before white men came to America continue to puzzle and attract scientists. In response to a telegram from Folsom received by the Smithsonian Institution, reporting new discoveries of stone arrow-points and fossil bison bones, Neil Judd, a Smithsonian anthropologist, has set out for the scene of the excavations to examine the remarkable evidence. The excavations are being conducted by the Colorado Museum of Natural History and the American Museum of Natural History.

The stone arrow-heads used in the hunt have been found close to bones of bison supposed to have become extinct in America long before men appeared on this continent. If the stone weapons were shot at this liv-

ing game, as the evidence indicates, the conclusion of some scientists is that men must have inhabited America at least 25,000 years, possibly even several hundred thousand years. No evidence has ever been discovered in this country to show that the types of bison found with the arrow-points have lived in America in recent times.

Dr. Oliver P. Hay, of the Smithsonian Institution, is now engaged in studying some of the bones of these extinct bison. The bones found at Folsom belong to bison with flattened horns different from any living form, Dr. Hay states.

Additional clues to the age of the bones and the weapons are the depth and formation of the earth in which they lie and the layers of soil that have accumulated above them in the progress of time.

A CORN BORER PARASITE

(Science Service Correspondent)

A NEAR relative of the silkworm disease which caused the famous Pasteur much grief, but also brought him much fame, is being studied in France as a possible ally in the war against the corn borer.

It is known that insects suffer from a multitude of diseases, many of which are epidemic and destroy large numbers, but the practical applications of insect pathology present an almost unexplored area of science. Insect diseases, like those of man, are usually caused by microbes such as bacteria, fungi, or the ultramicroscopic group of viruses.

Dr. A. Paillot, in a paper presented at a recent meeting of the French Academy of Science, reported the discovery of two new protozoa or single-celled animals which are parasites of the European corn borer in certain parts of France. One is a flagellate and propels itself forward and backward with a nearly ultramicroscopic whip-like appendage. It is quite rare and is found occasionally in the internal organs of the corn borer larva.

A more promising disease is a microsporidia to which Dr. Paillot proposes to give the name *Perezia pyrausta.* It spreads decidedly in an epidemic fashion, and has been observed frequently in two regions of the Jura. Dr. Paillot says that externally the sick corn borer larvae do not differ from the healthy larvae, but that internally they are pretty badly wrecked. The disease is transmittable from individual to individual through the intestinal tract.

THE CHEMIST AND THE FOOD SUPPLY

THE specter of starvation pressing on an overpopulated world is something the chemist refuses to worry about. Economists and sociologists have concerned themselves over the population problem ever since Malthus worked out a statistical expression of it over a century ago, but they always assume unchanging needs and tastes on the part of the population, and unchanging methods for the production of food.

At the meeting of the Institute of Chemistry of the American Chemical Society, Dr. H. E. Barnard, of Indianapolis, challenged these assumptions, and declared that the chemist will be able to meet the food problems of any imaginable future population. The only thing that can limit the race is sheer lack of standing-room, he said.

"The sociologist and economist study the Malthusian doctrine very differently from the chemist," Dr. Barnard continued. "They would limit world population to the number of people who can live happily and comfortably under the best living conditions to-day. The chemist is not so much interested in ideal living conditions as in applying scientific law to do the work of the world, no matter whether it is concerned with shelter or food or comfort.

"The chemist is impatient when he hears the Malthusian doctrine discussed in terms of wheat acreage, or sugars, or fats, for he is confident that when the fertile acres of the earth do not produce crops sufficient for man's needs he can synthesize them in his laboratory. Indeed he is already doing it. When the need comes the chemist will convert the light of the sun and the nitrogen of the air into food for the human family. Thirty men working in a factory the size of a city block can produce in the form of yeast as much food as 1,000 men tilling 57,000 acres under ordinary agricultural conditions. To the chemist the Malthusian doctrine is but the sad reflection of a pessimistic world."

THE USE OF FURFURAL

FURFURAL may well become the chemical word familiar to every household of the coming generation, as coal-tar is to those of the present. This is the prophecy ventured by C. S. Miner, of Chicago, before the Institute of Chemistry of the American Chemical Society now in session at Evanston, Ill. And the discovery that this hitherto rare chemical can be made cheaply in commercial quantities is almost an accident, the result of experiments aimed at an entirely different objective, he said.

In the preparation of rolled oats, hundreds of tons of oat hulls are left as a by-product at the end of the milling. Little use could be found for them, and they accumulated around the mills in vast quantities. In an endeavor to render them edible, at least for cattle, they were subjected to various chemical tratments, and one of these experiments resulted in the production of furfural in appreciable amounts. Since then research has followed two lines: to produce it as economically as possible, and to find new uses for it.

Furfural is very active chemically, is a solvent of wide application, and possesses many properties tending to give it commercial value. It is at present being used very extensively in the manufacture of synthetic resins and moulding compounds. Recently a light-sensitive furfural resin has been produced which is used in the preparation of printing plates.

Because of its germicidal properties and also its fungicidal properties furfural is finding application in the preventing of fermentation in glues and dextrin pastes, as well as in the preparation of disinfectants and deodorizers. Some derivatives of furfural are being used as

seed disinfectants and furfural itself is used in the preparation of tree wound dressings.

"Research men are constantly working with furfural and its derivatives and undreamed of uses for them are found every day," Mr. Miner said. "The annual crops furnish an almost inexhaustible, relatively cheap supply of raw material for the production of furfural, and as it is a highly reactive compound capable of functioning as the raw material for a wide range of chemical manufacturing processes, it may well form the basis of a branch of American chemical industry comparable in importance to the coal-tar industry in Germany."

PEROXIDES

ALTHOUGH the average citizen is familiar with only one peroxide, hydrogen peroxide, which he uses for a mouth-wash and his daughter may use for a hair bleach, peroxides of various other kinds play a more important part in his daily life than is usually realized. Some of the things for which peroxides are useful were described before the Institute of Chemistry of the American Chemical Society recently by Dr. V. R. Kokatnur, of Arlington, N. J.

"Hydrogen peroxide can be described as being composed of two parts, viz., oxide head and hydrogen trunk," said Dr. Kokatnur. "If this oxide head of hydrogen peroxide is attached to a trunk of a different genus such as one severed from organic compounds, we get an organic peroxide.

"Nature has many such organic peroxides. When a drying oil such as linseed oil, tung oil or turpentine dries in air, it forms a tough film of organic peroxides and in a sense the paint and varnish industry may be said to depend on this discovery. When a beautifully colored leaf or flower fades or changes its color in fall, it is perhaps due to a whole or part bleaching of such colors by peroxide formation.

"The oxygen of organic peroxides is of active type and is many hundred times more powerful than oxygen of hydrogen peroxide. This property makes organic peroxides extremely useful in arts and industries. Thus nearly fifty per cent. of flour consumed in the country is bleached and treated by an organic peroxide. More flour is reclaimed than would otherwise be available for human consumption by this treatment. They are increasingly being consumed in the refining and bleaching of many of our edible oils."

Dr. Kokatnur prophesied a possible important rôle for these little-known compounds in developing a future liquid fuel supply.

"There are many other outlets awaiting future exploitation but one of them provides a wonderful tool in the hands of a chemist for novel synthetic products," he said. "While they may not be cheap and commercially feasible in the immediate future the changed circumstances might make them very important. The present hectic efforts being made to replenish the gasoline supplies from other sources like coal can not really solve the problem. Even the coal supplies can not last forever and the only way to solve the problem is to fall on sources that are perennial and can be grown from the soil. Organic peroxides might then point the way to replenish the gasoline supplies from such perennial sources."

ITEMS

THE color test for vitamin A in cod-liver oil has now been proved thoroughly reliable when compared with the old, biological method of testing for presence of this vitamin, according to experiments carried on at laboratories in the University of Sheffield, University College, London, King's College for Women, London, The Lister Institute and the University of Oslo. At these laboratories several different samples of the oil were tested by the biological method, which is a feeding method carried out on experimental animals, and the same oils were tested by the color test by Dr. Otto Rosenheim, of the National Institute for Medical Research, London, who originally devised the color test. The results were so similar that the reliability of the color test was proved without any doubt. The two methods are now to be compared for other substances containing vitamin A, such as butter.

SOME physicians have for a long time been prescribing cod-liver oil to children and adults who were pale and listless, had no appetite and tired easily, who were, in reality, suffering from a low-grade anemia. Experiments carried on at the Kansas State Agricultural College have shown that the oil helped these patients by increasing the number of red cells in their blood. The experiments were made on college girls who took a teaspoonful of the oil daily. The gain in red cells after eleven weeks is reported at from 800,000 to 1,500,000. The girls all showed a corresponding improvement in physical condition.

THE difficult job of keeping contact with the white man's "farthest north" on this continent, and the scientific study of the still relatively unexplored Arctic, are the tasks faced by the Canadian Government steamer *Beothic*, which has set out from North Sydney, N. S. The first port of call will be Godhavn, Greenland, where courtesies will be exchanged with Danish officials. After that the *Beothic* will turn westward for the season's cruise among the islands off the northern coast of North America.

A FREAK stroke of lightning apparently electrocuted a large white oak tree in the New York Botanical Garden recently. The tree was struck during a thunderstorm, but was not shattered as trees frequently are by lightning. Almost immediately, however, the leaves began to wither, and within a month the tree presented an autumnal appearance against the bright green of the rest of the grove. Continued observation convinced the garden authorities that the tree was dead, and that it had apparently died instantaneously. After it was cut down a ring count gave its age at approximately 200 years.