SCIENCE NEWS

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THE GIACOBINI-ZINNER COMET

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THE Giacobini-Zinner comet, periodic comet absent from the region of the sun and earth for 6.6 years, has again been sighted and the amazing meteor shower which Europe saw in 1933 may still have a chance to be repeated. Dr. George Van Biesbroeck, of the Yerkes Observatory of the University of Chicago, has discovered the comet whose crossing of the earth's orbit in 1933 caused the memorable meteor shower.

Astronomers had calculated that in 1933 the earth passed through the region of space occupied 80 days earlier by the Giacobini-Zinner comet. This region was still "dusty" from specks of matter carried along in the same orbit as the comet. As these specks struck the earth's atmosphere they flashed as "shooting stars." Astronomers had thought possibly that on October 9, 1939, this same happening might occur again.

The rediscovery of the Giacobini-Zinner comet occurred at a position almost precisely that predicted by astronomers. This means that its orbit has been disturbed only slightly, if at all, during its absence of 6.6 years from the region of the earth. Preliminary calculations prior to the comet's discovery suggested that the earth should precede the comet by some 136 days, to the point in space where their orbits crossed. Astronomers still hope for a meteor shower in 1940, when the Giocobini-Zinner comet passes ahead of the earth by 229 days.

The position of the Giacobini-Zinner comet, at the time of its discovery by Dr. Van Biesbroeck on October 15, was at right ascension 16 hours, 21 minutes and 7 seconds, while its declination was plus one degree, 18 minutes and 53 seconds.

While its magnitude is so faint (15th) that only telescopes can see it, astronomers will be able to detect it about half way up to the zenith in the northwestern sky shortly after sunset. It is near the center of the triangle formed by the widely separated bright stars, Vega, Arcturus and Antares.

THE EFFECT OF SUB-OPTIMAL DIET

AT the Pittsburgh meeting of the American Public Health Association Drs. Henry Borsook, professor of biochemistry at the California Institute of Technology, and Wilton L. Halverson, health officer of Pasadena, Calif., reported a survey showing that families on sub-optimal diets—less than the best—were no less healthy than families having adequate food intakes.

"Families on sub-optimal diets," they declared, "were not found by the measures employed to have a greater degree of ill health than those having adequate food intake. A study of a larger number of families over a period of years utilizing more exact measures of ill health will be necessary to show the alleged harmful effects of a sub-optimal diet."

The diets of 50 families, 151 adults and 72 children, in economic levels from relief to those with annual incomes of $3,000 were studied. Clinical examinations were made of 80 persons in 25 of these families, including height, weight, evidence of rickets, heart, lungs, skin texture, hair texture, teeth and blood tests for anemia. No correlation between defects and dietary insufficiencies were found.

These families spent from $0.89 to $4.80 per person per week for food. Practically all families spending as much as $2.08 per person per week were eating adequately, and so were some spending as little as $1.50 per person per week.

Only about half the families got enough to eat as measured in calories. They were low on protein but got enough fat and starches and sugars. As to the important minerals and vitamins: They all got enough iron, according to present nutritional standards, but about half of them did not get enough calcium or lime. Almost all the families went short on vitamin A rations, only one getting more than the recommended amount. About a third of the families got less than enough vitamin B. All of them, however, received enough vitamin C from their diets.

THE PREVENTION OF INFLUENZA

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LIEUTENANT-COLONEL A. PARKER HITCHENS, M.C., professor of public health at the University of Pennsylvania, speaking at the meeting of the American Public Health Association, called attention to the fact that two weapons, a vaccine and a germ-fighting lamp, are ready for trial in the next great influenza epidemic. Either or both of them may emerge from such a trial as a practical means of preventing influenza. At least three institutions in America and one in England have already vaccinated small groups of people. If these groups come through the next epidemic without having influenza, the value of the vaccines will be shown. The institutions are all guarding their vaccination work, because they are not ready yet to vaccinate the entire population, even in the event of an epidemic. Under such conditions they could not get the accurate information necessary for a real appraisal of the vaccines. But they are ready and waiting for the results with the groups already vaccinated to show whether the entire population of a nation can be protected against influenza.

The influenza-fighting lamp, designed by Professor William F. Wells and Dr. Mildred Weeks Wells, of the University of Pennsylvania, is designed to fight any disease like influenza whose germs travel through the air, by letting down a curtain of ultra-violet rays to keep the germs out of a room and to kill any that may already be in the room. Similar lamps are being used in many operating rooms throughout the country to keep germs out of open wounds.

Schools and hospitals are already, in a few places, using the Wells lamp to protect children from germs of influenza, measles and similar infectious diseases. English, French and Canadian medical authorities, hearing about it at the

recent Congress of Microbiology in New York, are considering use of the lamp in dormitories to protect children, especially where there is crowding due to evacuation of children from London, Paris and other large cities.

THE SUPPLY OF VANADIUM

URAVAN in Colorado, a new city, sounds as if it might be a Soviet settlement in the Urals, but it is instead a glowing achievement of American private enterprise, and a symbol of the reasons why the United States can never again be cut off from a supply of the essential silver-like alloy, vanadium.

Uravan is almost as remote as if it were in the Urals, at that. It is 115 miles from the county seat, Montrose; 60 miles from the nearest railroad, at Placerville. It is just east of the Utah line in southwestern Colorado, as wild and lonely a section as there is in the United States.

A few years ago Uncle Sam ranked a distant last among producers of vanadium, a strategic metal both in war and peace. In 1936 only 63 tons were produced here. By 1938 that production had leaped to 732 tons, an increase of more than 1100 per cent. The United States has in this short time become the producer of a third of the world supply.

This is especially important because, with the exception of Mexico, a minor producer, the centers of vanadium mining were in Northern Rhodesia, Southwest Africa and Peru—all far away.

Vanadium by increasing the toughness and "springiness" of steel has become well-nigh indispensable in the manufacture of autos and other vehicles, besides having many direct uses in war.

The Vanadium Corporation of America, a subsidiary of the Union Carbide and Carbon Corporation, developed the mines and the town. It is said that there is enough ore to keep the plant going for a hundred years.

This is not the first mining in the area. Instead it was the scene of one of the most important and romantic ventures in the history of American mining. Here was found the world's first major supply of radium, only a few years after it was discovered. The Standard Chemical Company and the Flannery interests of Pittsburgh worked thousands of tons of the carnotite ore for a thimbleful of radium. When the women of America gave Madame Curie a gram of radium it came from Colorado. Then the rich deposits of the Belgian Congo were discovered and the American mines became unprofitable. Those carnotites, and the vanadium ores which the radium miners threw over the dump, are among those now being worked at Uravan.

Both radium and uranium are being produced again, but now as by-products of the vanadium production. In 1938 the mines produced 7,811 milligrams of radium, against 3,141 in 1937.

As for vanadium, Colorado produced 1,382,000 pounds of concentrates in 1938. This was more than the whole United States production in 1937, and the total United States production in 1938 was only 1,613,000 pounds. In other words Colorado produced more than 80 per cent.

The company payroll runs about $50,000 to $60,000 a month, there are between 200 and 250 working, and the production is about 250 tons of ore daily. The town is completely company-owned, and such necessities as coal are brought in—from its own mines—by the company. Beef and vegetables are raised in the near-by Paradox Valley—so called because the Dolores River takes its stubborn way right across the waist of the valley instead of flowing down it as a well-conducted river should—but staples must be trucked in from Montrose or Grand Junction.

ALASKA AND EUROPEAN REFUGEES

OPENING the door of Alaska to European refugees and United States immigrants, is a proposal now taking on a new and favorable angle.

While international conferees have been discussing the fate of several hundred thousand refugees, the United States' leading possibility for helping to resettle some of the homeless in Alaska needs Congressional action. The Department of the Interior advocates that private development corporations be permitted to open up suitable areas in Alaska, to offer opportunities for selected refugees and immigrants also from the states.

Since this view was reported, in August, the Department of the Interior, in cooperation with the State, Commerce and Labor Departments, has been putting finishing touches on a bill to provide a practicable way for admitting foreign settlers to Alaska. The favored plan is to provide a new quota-exempt class, exempting from quota provisions Alaska settlers as long as they are engaged in the corporate ventures, in the same way that students and certain other classes are admitted to the United States without conforming to quota requirements. The foreign settlers would not be permitted to enter the United States from Alaska except under quota provisions.

Alaskan industries, according to one advocate of the planned colonization project, are the type to be stimulated by war. Alaska has the only tin resources under United States control, and these are not fully developed. We still import 99 per cent. of our tin. Platinum, copper and gold are being produced on a limited scale and there are unworked deposits of coal, nickel, asbestos and gypsum.

Southeastern Alaska's forests offer Sitka spruce lumber as well as pulpwood sufficient to print one fourth of the news in the United States. Since the United States depends on foreign supplies, chiefly Canada, Finland and Sweden, for three fourths of its newsprint, the assurance that Alaska not only can supply timber but has the water power for running pulp and paper mills is more important now than it was two months ago.

Fish is always a food product in demand in wartime, and Alaska offers fishing opportunities, not so much perhaps in the salmon industry, which is already well developed, as in the herring industry. The United States imports almost all of its herring from Scandinavia and Great Britain and the pack of salted and pickeled products is likely to be diverted toward European needs.

The project for developing Alaska differs from most proposals to aid refugees and others seeking new opportunity in that Alaska's possibilities are industrial as well as agricultural. Those favoring planned pioneering to

develop Alaskan resources point out, also, that the climate in many regions suitable for industry is no more rigorous than in Washington or in New York, and that a number of the present settlers are of southern European origin.

Individual pioneering in Alaska, or almost anywhere else, is over, it is argued by those who have been investigating Alaska's prospects. The new era of pioneering is seen as necessarily a planned economy, in which industrial development would be balanced and directed toward actual market needs.—EMILY C. DAVIS.

STAINLESS STEEL

A NEW way to prevent corrosion of stainless steel in salt water, long an Achilles heel of an otherwise excellent structural material, was described at the opening meeting of the American Institute of Mining and Metallurgical Engineers at Chicago as part of the giant National Metals Congress now in session.

Dr. H. H. Uhlig, research associate of the Massachusetts Institute of Technology, described long-continued research to seek the causes and the prevention of the corrosion of stainless steel in salt water. It has been this handicap which has, in the past, led the U. S. Navy to regard, with only mild approval, the use of stainless steel on naval vessels where it is subjected to sea water.

Dr. Uhlig's research, supported by grants from the Chemical Foundation, shows that if stainless steels are exposed to air for some hours, or if they receive treatment by an oxidizing solution directly after the pickling operation, they will be corrosion-resistant in salt water.

Dr. Uhlig has worked in a cooperative research at the Massachusetts Institute of Technology, which has resulted in a number of important patents on ways of increasing the ability of stainless steels to resist corrosion. Those who have taken part in this research include John C. Wulff, Albert L. Kaye, and Professor Robert S. Williams.

Among the discoveries is the use of small amounts of the chemical that produces smoke for warfare, titanium tetrachloride, to give stainless steel a lustrous and extra smooth new surface which is especially resistant to pit corrosion. This surface has such luster that it can be fabricated into beautiful jewelry, rivaling precious metals in appearance.

They have also found that minute amounts of silver, as little as .42 per cent., can cut down the salt water corrosion of stainless steels more than 80 per cent. The silver, moreover, greatly improves the rolling and machining properties of the metal.

ITEMS

RAINFALL for the month of October thus far ranges from half normal or less in the western Prairie region, through one fourth to one third in the Ohio valley, 10 per cent. normal in Tennessee, down to almost zero in parts of the Gulf states and in western Kansas. This, following an abnormally dry September, creates a serious situation.

DIPHTHERIA threatens to become wide-spread and severe in the South and there is no assurance that it will not do the same in the North. Diphtheria germs found in different parts of the country vary considerably in their disease-causing ability, according to a report made by Dr. Martin Frobisher, of The Johns Hopkins University, Baltimore, to members of the American Public Health Association. In the South, particularly in Virginia and Alabama, a more virulent, dangerous kind of germ has been prevalent within the last two years. During this same period there have been more cases of diphtheria. In the North, where diphtheria cases have declined enormously in the past ten years, a different type of germ is found. These facts suggest that health authorities, by studying the kind of germs in their locality, can predict the coming of an epidemic or of more severe cases of diphtheria. Not enough information is available yet, Dr. Frobisher said, to be sure whether such predictions can be made accurately, but he stressed the need for further studies along these lines.

COMPLETION of a breeding program to produce chrysanthemums as brilliant and showy as most of the greenhouse varieties now in use, but able to survive winters as far north as Michigan and Wyoming, has been announced recently by the U. S. Department of Agriculture. The new chrysanthemum varieties, of which there are a dozen, all bearing Indian names, were developed by F. L. Mulford, who recently retired, after long service in the Bureau of Plant Industry. Mr. Mulford let nature do the selecting for hardiness and earliness. Late bloomers he ruthlessly discarded, and he let winter cold kill off non-hardy seedlings. The Department of Agriculture does not have any plants for free distribution, though it does have a free bulletin (Circular 528) describing them. The plants have been put into mass propagation by several leading commercial firms.

EXPERIMENTS concluded at the Massachusetts Institute of Technology show that old-fashioned molasses is about the best food known for treating nutritional anemia, the kind of anemia due to improper diet. Spinach as a source of iron was thoroughly debunked by the research conducted by Dr. Robert A. Harris, Dr. John W. M. Bunker and L. Malcolm Mosher. Whereas molasses has 6.1 parts of usable iron per 100,000 parts by weight, spinach has only 0.5. Beef liver has 5.6; oatmeal, 4.6; apricots, eggs and raisins following in that order. Usable iron was computed, not total content, for only that iron which the body can use to manufacture hemoglobin is valuable. Both chemical and biological tests on rats were used. It is also reported that recent medical studies indicate that nutritional anemia is far more prevalent than had been suspected. More than 40 per cent. of infants have it and the figure for adult women is as high as 70 per cent. It is also fairly wide-spread among growing children.

THERE are autumnal migrations of bats as well as of birds. Much less is known, however, about bat migrations. Some of them appear to be for considerable distances, but many species only travel to some cave especially well adapted for comfortable and secure hibernation, which is not used as summer sleeping quarters. Other bat species do not migrate at all, but find their summer roosts good enough for the long winter sleep as well. No bats, however, remain active throughout the cold season as do some species of birds.