SCIENCE NEWS

Science Service, Washington, D. C.

DISCOVERY OF SATELLITE-LIKE OBJECT NEAR JUPITER

THE discovery of what may prove to be the tenth satellite of the planet Jupiter was made at Lick Observatory when Dr. H. M. Jeffers, of the observatory staff, noticed a very faint heavenly object that has the same motion in the sky as the eighth satellite which he was photographing.

Dr. R. G. Aitken, director of Lick Observatory, said that it is by no means certain that the object observed is a new and tenth satellite. He simply announced the photographing of a faint object near Jupiter having daily motions similar to that of satellite eight. Its nature is still uncertain. More photographs are being secured to permit computations to decide whether the object is satellite nine of Jupiter, a new tenth satellite or a minor planet or asteroid of unusual orbit. The new object is very faint and will be observable only in the largest telescopes. It is nineteenth magnitude, which is close to the limit of visibility.

This Jupiter's tenth satellite, if that is what it proves to be, will be one of a trio of extremely remarkable objects in the solar system, the three most recently discovered moons of Jupiter. These outer satellites move around the planet with what is called a retrograde motion, a direction opposite that of the seven inner satellites. The new object is probably only a few miles in diameter and it may be even smaller than the eighth satellite, the diameter of which is estimated at 25 miles.

Jupiter is the fifth planet from the sun and the second outward from the earth. It is the largest in diameter and with ten satellites, it would have the largest number of any of the planets.

USE OF OIL WASTE PRODUCTS

BY a "sweating" heat treatment of petroleum, called pyrolysis, chemists are now using former oil waste products to make a variety of alcohols highly desired by the lacquer, paint and varnish industry as solvents; a soap which cleans and lathers instantly in salty ocean water; a disagreeable smelling substance to go into the natural gas supply of homes and thereby make possible the quick detection of a leak; and synthetic rubber compounds resistant to gasoline and other rubber solvents.

These new by-products are the "cream" skimmed from the raw "milk" of petroleum by the new field of a study of petroleum derivatives, Carleton Ellis, of Montclair, N. J., reported to the twenty-sixth annual meeting of the American Institute of Chemical Engineers.

Chemistry, Mr. Ellis indicated, is attacking the problem of what to do with the many former wastes encountered in the processing of oil for the automotive industry with more than an even chance that a great field of research will be opened, rivaling the hundreds of thousands of dyes and other substances made from coal tar. Coal tar is the sticky, black ooze left behind after coal is heated in containers and coal gas driven off. From coal tar are obtained hundreds of aniline dyes like indigo; medical preparations such as phenol or carbolic acid; artificial flavoring and important chemical base products like anthracene and naphthalene.

The heat-treating of petroleum not only produces many of the important hydrocarbons found in coal tar on which that giant chemical industry is based, but the presence of these hydrocarbons in gasoline, later obtained from the oil, gives the gasoline a high anti-knock value which enhances its value as a motor fuel. The ability of chemistry to obtain many alcohols from petroleum will free grains and natural foodstuffs from the position of contributors to raw industrial sources to their natural position of foods.

"Instead of serving as industrial materials," said Mr. Ellis, "there will be more grain for cattle and cereals, more olive oil for salad dressings and more vegetable oils for other sorts of cooking. At the moment these prospects may not seem important, but in later years their value should have abundant opportunities to become established."

Ethyl alcohol, he added, will eventually excel all the alcohols in only one field and for one purpose—for drinking.

SELENIUM COLLOIDS IN THE TREATMENT OF CANCER

A NEW treatment for cancer, devised by a British physician, has given relief to some cancer patients whose cases were called "hopeless." It can not be called a cure, since it has not been used long enough to know what the ultimate results will be.

The new treatment reduces pain and discomfort and often enables patients who entered the hospital complete and hopeless invalids to return, for a time at least, to their normal life. It was devised by Dr. A. T. Todd, physician to the Bristol Royal Infirmary, who reported results with it in the current issue of *The British Journal of Surgery.*

Dr. Todd uses a new medicine known as a sulfur-selenium colloid and another colloid of selenium which is combined with radium substances so that it is slightly radioactive. The first medicine is called SSe for short, and the second is abbreviated as R.A.S.

In a large number of instances the patients treated by this method have become apparently well and are still alive more than a year after the beginning of the treatment, which was little used before 1931. Two cases are alive after 2½ and 4 years, respectively.

Dr. Todd first ascertains that all other types of treatment (surgery, x-rays and radium) have failed, that the diagnosis of cancer is certain and that the patient is willing to cooperate by having regular treatment for a period of years if necessary. He then starts by injecting into a vein four cubic centimeters, or about one teaspoon, of SSe. After 48 hours powerful x-rays are trained on the growth.

The doses of SSe followed after 48 hours by x-radiations are given weekly for eight to fourteen weeks. When the position of the cancer is such as to make the patient highly sensitive to treatment the dose is cut in half. By spreading the dosage of x-rays over a longer period than the normal eight weeks, when necessary, care is taken to avoid too marked a reaction.

After this preliminary course, in which the selenium is gradually "ionized," that is, changed in its electrical properties by the x-rays, the regular treatment is begun. For the first three weeks doses of R.A.S. are given at weekly intervals; thenceforward the doses of R.A.S. are given alternately with SSe, each every two weeks. The R.A.S. is believed to act in the same way as the x-rays, though on a much smaller scale, in ionizing the selenium colloid.

Dr. Todd believes this ionization to be an important part of the treatment, which is considered to act as a stimulant to the body's defensive mechanism against cancer, and not to have any direct effect on the growth. He has developed an ingenious theory as to the nature of this mechanism, and considers that cancer is an infective disease.

If the patient's condition appears to improve, the alternate injections of the two colloids are continued regularly and are stopped only when the cancer symptoms have disappeared. But when the treatment is unsuccessful the "preliminary" combination of SSe with x-rays is repeated after a three-month interval.

Insufficient time has elapsed to show whether this new method may sometime provide a complete cure for cancers otherwise incurable.

POST-MORTEM BLOOD FOR TRANSFUSION

BLOOD from the dead is now saving the lives of many patients who would otherwise bleed to death. Professor Serge Judine, chief of the surgical service of the Institute Sklifassovsky, the great emergency hospital of Moscow, has reported more than a hundred such transfusions without ill result.

Dying victims of traffic accidents and other emergencies are brought into this hospital in such numbers that the supply of blood from living donors is not enough to save them. At the same time, the ambulances bring to the institute many victims of accidents, violence and heart attacks who have only just succumbed. Professor Judine conceived the idea of using the blood from these dead bodies to save the living.

Careful studies showed that the blood remained alive and sterile, that is, germ-free, for eight hours after death. Tests to determine the group it belongs to and tests for syphilitic infection can be made up to four hours after death.

The first application of Professor Judine's idea on a human case was made on a young engineer who had attempted suicide by cutting the veins in his elbow. The patient was almost dead from hemorrhage when brought to the hospital. Professor Judine had on hand the body of a man who had died six hours before of a heart attack and whose blood was the same type as that of the young engineer. He gave the would-be suicide a transfusion of about a pint of blood drawn from the veins of the dead man. The usual remarkable response to blood transfusion occurred and the patient quickly recovered without any unfavorable reaction.

Blood is now regularly collected for such use. It is taken from the jugular vein and stored in large jars containing sodium citrate solution to keep it from clotting. Tests for blood group and for syphilis are made and it is then stored in a refrigerator at nearly freezing temperature. After two weeks of such storage it is still sterile and living and the red cells are able to perform their mission of carrying oxygen. When needed it is heated to a little more than body temperature and strained through several layers of gauze as a precaution against small clots that may have formed.

MIGRATION AND SUPERIORITY

NATIVE American farmers in the eastern United States are surprisingly incompetent in comparison with their immigrant neighbors when their inherited opportunities are taken into account, according to a statement made by Dr. Ellsworth Huntington, of Yale University, at the annual meeting of the Population Association of America. The laws of migration are of the utmost importance historically, economically, politically and socially, although they are little understood.

"The first law, as to the selective quality of migration," he explained, "is illustrated by the way in which the long distance migrants, no matter where they were born, or where they now live, rank consistently above the non-migrants and the short distance migrants. The second law, as to the attractive power of opportunities, finds its illustration in the fact that the cultural rank of the people here considered rises in harmony with the size not only of their birth-places, but of their places of residence. The third law, as to the correlation between the length or difficulty of the migration and the quality of the migrants, receives confirmation in the systematic way in which the long-distance migrants stand above the others except perhaps in the great cities and their suburbs. According to the fourth law the farther people migrate the more those of different origin become alike.

"They have a direct bearing not only upon immigration policy, but upon such every-day problems as the value of real estate, the advisability of starting industries and methods of preventing crime. Scarcely any major phase of modern life is free from complications due to the selective action of migration.

"Other things being equal, the longer, or more difficult a migration, the more closely do people from all sorts of sources resemble one another at the end. This suggests that the relatively weak elements in a population are in some ways its most characteristic portion. The farmers of China, Russia, Germany and America differ from one another in their ways of working, living and thinking much more than do the most highly educated and cosmopolitan members of these various nations. Men like Tolstoi, Tagore, Einstein and Woodrow Wilson have far more in common and far more sympathy for one another than do ignorant laborers from the same countries. It seems to follow from this that if in the course of centuries new nations could be built up from the finer elements of the present nations, their differences

would be much less than those which now divide one part of the world from another.

"Applied to the United States and its relation to foreign countries the laws of selective migration lead to certain conclusions at which many people may balk. For example, although most people agree that urban populations are more competent than those of rural districts, many will violently assail the idea that the average quality of the American people improves from east to west and is highest on the Pacific coast. Perhaps they are right, for any just conclusion must take note of all the laws of migration.

"One of the laws suggests that although the average migrant from the eastern to the western states outranks the average person who is left behind, the number of westward migrants belonging to the most highly competent sections of the population has been proportionally much lower than among those of less ability. Moreover, the wealth and opportunities of the East attracts many westerners of high ability, whereas those of lower ability do not show so much tendency to migrate back to the East.

"This means that as a result of migration the East tends to be characterized by a high percentage of unusually able people and a correspondingly high percentage of people of less than the average ability. In the far West, on the other hand, the tendency seems to be toward a population with relatively lower percentages of the highest types of leadership and the lowest type of incompetence, but with a very large and substantial middle class.

"The average level of this middle class is so high that we may well expect that in time it will produce many leaders of unusual ability. Judging from older lands it also seems reasonable soon to expect from the West great contributions to human progress and betterment. Already such contributions are beginning in the fields like astronomy, and we may look for them also along lines of economic, political and social betterment."

ITEMS

MEASLES has broken a twenty-one-year record. The number of cases reported each week has been higher than at any time since the U. S. Public Health Service began keeping records of this disease in 1912. The epidemic has just begun to abate, less than 30,000 cases being reported weekly now. At the peak of the epidemic, during the first week in April, 35,000 cases were reported by state health officials to the U. S. Public Health Service.

A NEW method for increasing the vitamin D content of evaporated milk on a commercial scale has been developed by K. G. Weckel and H. C. Jackson, of the University of Wisconsin. The usual commercial methods of manufacturing evaporated milk are followed prior to and after irradiation. The new process includes the use of a specially devised machine which permits the hot evaporated milk to flow in a thin film over an inner corrugated surface while it is being exposed to the ultra-violet rays produced by a carbon arc lamp. After irradiation, the milk is homogenized at the usual pressures, is cooled, canned and sterilized in the normal way. Mr. Weckel and Mr. Jackson also found that cream can be irradiated without losing its natural and desirable flavors, which was formerly doubted. The irradiated cream is then recombined with the rest of the milk and handled in the customary commercial way. Both processes are now commercially possible and evaporated milk companies are producing such milk under license. When this new irradiated evaporated milk is diluted with an equal part of water it has the same amount of rickets-preventing vitamin D per quart, which is 50 Steenbock units or about four to five times that of normal milk, as is required for the ordinary irradiated whole milk now on the market.

A TEN-MINUTE test with a mouse will show whether or not a horse has been treated with morphine or heroin before a race, according to a report made by Dr. James C. Munch, of Temple University and the Sharp and Dohme Research Laboratories, to the American Pharmaceutical Association. A quarter of a teaspoonful of the horse's saliva is injected into the mouse. Within ten minutes, if the horse has been given morphine or heroin, the mouse's tail curves up into the shape of the letter S. In addition, the mouse humps up his back, his hair stands on end and his hind legs become twittery. Chemical tests for morphine in the saliva take two days and are less sensitive than the mouse test, which shows the presence of as little as one seventy-five-thousandth of a grain of morphine.

BOYS and girls start their adolescent spurt of growing when they have reached a certain height rather than at a certain age. This finding was reported by Dr. Carroll E. Palmer, of the U. S. Public Health Service and the Johns Hopkins School of Hygiene and Public Health, at the meeting of the American Association of Anatomists. Dr. Palmer analyzed annual measurements made during a period of four to seven years on about 2,500 elementary school children between the ages of 6 and 14 years. The adolescent acceleration of growth begins, apparently independent of age, when girls and boys reach an average height of 50 and 53 inches, respectively, he found. From the age of six years to the start of this adolescent growing spurt there is practically no association between the average gain in height and that height already attained by the child.

A DIMINUTIVE dinosaur was described before a meeting of the Paleontological Society by Professor Charles L. Camp and Dr. V. L. VanderHoof, of the University of California. The remains of this small saurian, which ran about on its hind legs, like a bird, were found in northern Arizona by members of a party under the leadership of Dr. Ansel Hall, of the U. S. National Park Service. Other papers at the session of the Paleontological Society disclosed a record of much activity and many discoveries of interesting and important fossil records in the West. They included new links in the line of descent of horses, an extinct rabbit-like animal, the skull of a gigantic extinct bison, and a possible ancestor of the beautiful but zoologically puzzling modern pronghorn antelope.