SCIENCE NEWS

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THE TENTH SATELLITE OF SATURN

SATURN may really have ten satellites, according to a report in the British journal, *Nature*. John Miller, of London, a member of the British Astronomical Association, suggests that a tenth satellite may be found in the region between the present eighth and ninth satellites of brilliant Saturn. The orbit of the tenth satellite, if it exists, should be about 2,000,000 miles farther out from the one known as Iapetus and 4,000,000 miles inside the orbit of the outermost satellite, Phoebe. The 6,000,000 gap in space between Iapetus and Phoebe has long been of interest to astronomers. If the approximate placing of the satellites follows the astronomical rule known as Bode's law, then satellite 10 should be found at the distance Mr. Miller suggests.

Bode's law is a long-known empirical rule which has no physical explanation. The so-called law states that there is a regular progressive increase in the mean distances of the planets from the sun. The law holds good for all the planets except Mercury and Neptune and can not be regarded as merely coincidental truth. With the planets, if one takes the distance of Mercury's orbit from the sun as a starting point and calls the distance from Mercury's orbit to the orbit of Venus as 3, then the distance of the other planetary orbits from that of Mercury turn out to be roughly in the geometrical progression 6, 12, 24, etc. This same general relationship seems to apply to satellites. In his report to *Nature*, Mr. Miller sets up two tables of values—one for the observed distance in miles between the orbits of the respective known satellites and another giving the distances based on geometrical progression. In most cases the agreement for the nine known satellites is fairly good. There is only one large discrepancy. That is the blank hole in the table which Mr. Miller suggests is the spot for the yet undiscovered satellite. In 1905 the late Professor W. H. Pickering reported a faint satellite of Saturn which has never been confirmed. Mr. Miller suggests that perhaps the tenth satellite is the missing object reported 33 years ago by Pickering.

PROSPECTING FOR OIL

ACCORDING to a report by Dr. M. M. Leighton, Illinois State Geologist, oil wells in places regarded as impossible before 1930, located by systematic use of modern scientific prospecting methods, have led to the discovery of eight new oil pools in southern Illinois and the increase of the known oil reserves of the state by at least 100,000,000 barrels.

Found as a result of a planned search, these new oil pools are in an area regarded as barren before 1930. Realizing, as a result of intensive field work, that there should be domes within the great Illinois Basin, the state geologist's forces, with some private companies, began an intensive search for such oil traps, located a number of probable traps by geophysical methods, and proved the correctness of their findings by bringing in producing wells on eight of them. Modern prospecting methods have cut drilling losses more than fifty per cent. Wildcat drilling (drilling in areas where there are no producing wells) resulted in bringing in oil only once in every ten attempts during 1937 when the well was sunk only on a "hunch." When the suspected area was first gone over by geologists with modern methods, the score was one producing well for every four wildcat drillings.

With Illinois oil production already tripled by these new fields, 150 or more geologists working for oil companies are now at work endeavoring to locate new oil pools. Increasing the recovery of old oil fields by secondary methods is now being tried in Illinois, following the general ideas used in the Bradford Oil Field of Pennsylvania. Water poured into some wells revives the others near-by, increasing the ultimate production considerably. By this method, Dr. Leighton says, Illinois oil fields may yet produce as much oil as has already been pumped from them.

SOIL RESEARCH

IN an attack on the problem of soil erosion on the western plains, two wind tunnels, one in the laboratory and the other out in the field, are being used at the Soil Research Laboratory of the Dominion of Canada Experimental Station at Swift Current, Saskatchewan.

Patterned after wind tunnels used by aeronautical engineers the world over, two machines have been set to work to tell erosion specialists exactly how erosion takes place, according to J. L. Doughty, senior soil specialist at the station.

Investigators will shortly begin measuring the wind velocity necessary to make particular types of soil fly away with the wind. By means of the pair of tunnels, they also expect to study the nature of the drift and of sedimentation. The larger of the two units, a 20-foot-long tunnel in three sections can be moved to different fields for actual tests outside the laboratory. The smaller unit, five feet long, is for laboratory use. Airplane propellers powered by variable speed motors provide the air blast to shake loose top-soil so that its behavior can be measured. The engine for the portable unit is mounted on a truck.

The first section of the portable unit consists of a box with vertical panels to eliminate turbulence and thus to secure a steady wind stream. The second is closed on the top and sides, but is open on the bottom so that the air blast can rip up the soil. The third portion, at the end away from the propeller, is closed on the bottom and open on the top. It is protected by screens to slow down the air stream and permit settling of the dust particles to begin.

"This machine," Mr. Doughty writes, "is taken directly into the field, and the tunnel set up over an area of soil which has not been disturbed since the last cultural treatment. The exposed test area is then subjected to an air blast of known velocity for a definite period of

time. If drifting does not occur, the velocity will be increased and kept constant for another period. By this means, the velocity required to start the particles moving and the amount of soil moved during a definite time with a known velocity of wind are determined.''

Data resulting from the study, it is believed, will constitute one of the first exact determinations of the conditions necessary for rapid wind erosion. Wind erosion, in addition to weathering from rain waters, is a serious menace to the entire Great Plains area that stretches from the Rio Grande and the southern states north to ground too frozen to permit profitable farming.

Different soils, with different types of cultural treatment (on which different crops have been grown) will be studied, in order to determine ''the effect of different cultural treatments on the susceptibility of a soil to drifting.''

A still larger wind tunnel is to be built, Mr. Doughty adds. ''Present plans call for the construction of a tunnel 30 or 40 feet long, which would add materially to the data that could be obtained in a study of soil drifting problems.''

MALARIA MOSQUITOES AND WILDLIFE CONSERVATION

DR. L. L. WILLIAMS, JR., of the U. S. Public Health Service, speaking before the Third Annual North American Wildlife Conference, recently held in Baltimore, pointed out that creators of refuges for ducks and other forms of aquatic wildlife should take heed lest they raise malaria mosquitoes as well as ducks. Much of the Midwest was once malaria country. In the course of settlement and development of agriculture the old breeding waters of the mosquitoes were drained. Now the program for the restoration of American wildlife calls for the development of many new ponds and marshes where wildfowl, fish and other water-using creatures may feed and breed.

If these refuges are near human habitations, especially if they are in areas used for camping or resort purposes, a very few human malaria carriers might equip the ''right'' kind of mosquitoes for serious trouble-making. He added that something of this kind has already occurred in several places. Dr. Williams's discussion was one contribution in a panel discussion of the whole mosquito-control problem, in which his co-participants were Clarence Cottam, of the U. S. Biological Survey; Dr. F. C. Bishopp, of the U. S. Bureau of Entomology and Plant Quarantine, and William Vogt, of the National Association of Audubon Societies. General discussion from the floor followed, and was at times quite vigorous. The principal bone of contention was over the question, to drain or not to drain. Nobody had a good word to say for the mosquito, but many of the friends of wildlife feel that drainage as practiced at present is destroying great areas that have in the past been dependable providers of sport and food.

Mr. Cottam pointed out that in the coastal area from New Hampshire to Maryland 30,000 miles of drainage ditch have been dug, with an additional 36,000 miles in the South. Much of this, he believed, was unnecessary. Unrestricted drainage not only removes the water that wildfowl like and fish must have; it also upsets the whole biological balance. As the soil dries out the marsh grasses and the other good food plants perish, to be replaced with weed species that will not support wildlife. Small forms of lower animal life, used as food by wildfowl, also disappear. Use of oil to smother mosquito larvae came in for condemnation second only to that bestowed on excessive drainage. It was pointed out that equally effective mosquito control can be achieved by spreading Paris green, pyrethrum powder and other insecticides. In rebuttal to this it was urged that for many large areas where control is needed these methods are too costly. Differences do not appear to be beyond reconciliation, the floor discussions showed. A number of speakers, themselves mosquito-control workers and field biologists pointed out methods used in particular localities, where study of local ecological conditions made possible the suppression of the mosquitoes and yet left a refuge for ducks.

FRATERNAL TWINS

PROFESSOR WILLIAM WALTER GREULICH, of the department of anatomy and the Adolescent Study Unit at Yale University, presents a study in the forthcoming issue of the *Journal* of the American Medical Association, of the six pairs of fraternal twins in a Connecticut family. He has also looked into the family history of the twins' parents, Mr. and Mrs. H. F., of Putnam, Conn. Only on the father's side can a record of previous multiple births be found. The father's father had triplets by his second wife.

The wide-spread belief that twinning tends to run in families is supported by evidence here and abroad, and twin births everywhere seem to appear just as frequently on the father's side as on the mother's. Now this disturbing fact can not be reconciled with the accepted theory of the genesis of fraternal twins. Fraternal twins, as distinguished from monozygotic twins (those of the same sex and physical characteristics), are produced, it is usually assumed, by the fertilization of two ova derived from separate follicles either from the same or from different ovaries. Such double ovulations are exceptional and are generally regarded as the result of some upset in function of the ovulatory mechanism. The control of this would naturally be with the mother and could not possibly be influenced by the father.

Professor Greulich appeals to surgeons and pathologists to make observations during operations and postmortems on pregnant women that will help find a satisfactory explanation of this phenomenon. The most reasonable explanation, in his opinion, was advanced twenty years ago by Dr. C. H. Danforth and recently by Dr. F. Curtius, of Germany. According to this hypothesis, the sperm of some men causes the tubal ovum to form two cells, both of which are susceptible of being fertilized, each, of course, by a different sperm. Such fertilization would result in the production of twins who had the same heredity from the mother's side but different paternal heredity. Such twins might be of like or of unlike sex

and would presumably be intermediate between identical and ordinary double-egg twins in the degree of resemblance that they would bear to each other. The Connecticut family had its sixth pair of twins last June 12. The mother was 35 and the father 57 when they were born. Of the first pair of twins the boy died, but all others are living. Two pairs are of the same sex but do not resemble each other closely.

VITAMIN K

VITAMIN K, from fish meal, together with bile salts, is now being used in the treatment of jaundice. A preliminary report of encouraging results at the Mayo Clinic has just been made. The jaundice is the kind known as obstructive jaundice because it is due to obstruction of the flow of bile. The new vitamin treatment does not help the jaundice, but controls the bleeding which is a dangerous feature of the disease. Treatment of the jaundice itself is operation to remove the obstruction to the bile flow, but this is not always possible because of the tendency to uncontrollable bleeding. The new treatment has been used in 18 cases, Drs. H. R. Butt, A. M. Snell and A. E. Osterberg report. In certain cases, they state, this treatment "probably has prevented hemorrhage or has had a definite inhibitory effect on actual bleeding. We realize," they add, "that much more data must be collected before any definite conclusions may be drawn and that the whole problem is one of extraordinary complexity." The complexity arises from the fact that in spite of much research over many years by many individuals, the exact mechanism which normally prevents hemorrhage by making blood clot when it is shed is still not too well understood. The results with the treatment so far encourage the Mayo workers to believe that prevention and control of the bleeding tendency of the jaundiced patient may be attained in the "not too distant future."

Vitamin K is a relatively new vitamin found in hog liver oil, cabbage, spinach, tomatoes, alfalfa and various other natural sources. Dried alfalfa meal was at first used in the treatment at the Mayo Clinic, but as the patients could not tolerate this for long, the vitamin is now being obtained from fish meal. It is given together with bile or bile salts. Lack of vitamin K in the diet of chicks and certain other animals causes hemorrhagic or bleeding disease. In human patients suffering from obstructive jaundice, the bleeding apparently occurs because damage to the liver caused by obstruction to the flow of bile from the gall bladder makes it impossible for the patient to utilize the vitamin K in his food.

ITEMS

ROCKS of a geological formation half a billion years old, scattered from Alabama to Labrador, have been identified as belonging to the same system by fossils they contain, of two genera of trilobites, Wanneria and Olenellus, long since extinct. The rocks, of early Cambrian date, have also been shown to be similar to others in Scotland and Greenland. The investigations were carried on by Dr. C. E. Resser, of the U. S. National Museum, and Dr. B. F. Howell, of Princeton University. Their report is given in the *Bulletin* of the Geological Society of America.

FOUR distinct types of avalanche menace the skier, reports Donald McBride, mountaineer, writing in *Trail and Timberline*, the official journal of the Colorado Mountain Club. Of the four types, wet snow, dry snow, ice and snow-slab avalanches, the latter is the most dangerous to skiers in the Colorado Rockies. Recognizable by the great slabs of wind-deposited snow that form its débris, the snow-slab avalanche occurs when the weak snow under the slab melts away, leaving the strong slabs without support. These crash to the valley floor, sweeping all before them. Often the weight of a skier, crossing the "triggered" slabs, is enough to start a dangerous avalanche.

GUAYULE, the rubber-yielding shrub of the arid lands in California and adjacent parts of Mexico, will be planted in quantity during 1938 in the southern part of the Italian peninsula, in Sicily, and in the trans-Mediterranean province of Cyrenaica. This is part of Italy's effort toward economic self-sufficiency, and in particular it is hoped will provide an emergency supply of rubber in case of war.

A HELIUM refinery, to remove impurities from the helium gas that will float the *LZ–130* back and forth across the Atlantic, will be erected near Frankfort, home port for the sister ship of the *Hindenburg*. Low temperatures will condense and settle out gaseous impurities from the helium gas after use so as to fit it for further use and to conserve the precious gas, which must be purchased in the United States. Germany only recently purchased several million cubic feet of helium.

NOT one out of a hundred of the drivers coming into traffic court has learned how to drive his car with competence, tactfulness and care for the other fellow, Dr. Lowell S. Selling, director of the Psychopathic Clinic of the Recorder's Court, Detroit, reported to the Twenty-fourth Annual Highway Conference at the University of Michigan. His conclusion is based on an examination of hundreds of drivers in the Psychopathic Clinic. Many of the drivers involved in traffic offenses are insane, Dr. Selling has found. Many are dangerously feebleminded. Many are illiterate. And many are relatively normal, but their thinking processes about driving are bad. Ordinary psychological tests of such traits as reaction time, vision, color vision and hearing can not weed out the accident-prone drivers, Dr. Selling has found. And drivers with defects in some of these traits may be perfectly safe drivers, provided they are aware of their weaknesses and have the proper attitude. Deaf people, for example, had a better accident record than those who could hear, and in addition most motorists are driving deaf when their windows are up.