SCIENCE NEWS

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ISOTOPES, THE NEUTRINO AND URANIUM SPLITTING

A NEW way of separating isotopes quickly and effectively is suggested by Professor J. W. Beams and Dr. C. Skarstrom, of the University of Virginia, in the current issue of *Physical Review*. The new method would combine the whirling properties of high-speed centrifuges with the chemical fractionating column method employed by Professor Harold C. Urey, of Columbia University. Isotopes are the forms of chemical elements which have chemical properties so similar that ordinary chemical methods will not separate them. Yet they have slightly different atomic weights. Separating isotopes is one of the major tasks of physicists these days, for isotopes can be employed as "tracers" in studying the physiological happenings of the human and animal body and have already contributed much to knowledge of hitherto obscure body processes. To operate the new method would require a huge centrifuge, weighing tons, for the columns used at Columbia by Professor Urey are two stories high. An apparatus to whirl them around in a super-centrifuge would be very large.

In the same issue, Drs. H. R. Crane and J. Halpern, of the University of Michigan, describe their latest search for the elusive and never-found atomic particle, the neutrino, which is believed to have the mass of an electron, without electrical charge. By bombarding chlorine with deuteron particles from the huge Michigan cyclotron, the scientists have made it emit electrons, or beta rays. Studying the pictures of these beta rays in a Wilson cloud chamber has shown that the ordinary, every-day laws of classical momentum are not conserved unless one assumes that another particle (the neutrino) is liberated in the process. Because of the neutrino's neutral character actual pictures of its tracks have not been obtained, and probably they will never be found. But there are relationships showing definite directions in space in which the change of momentum occurs. This is interpreted as the line of direction of the neutrino.

The new attacks on the secrets of uranium splitting—the potential source of atomic power if scientists can ever find out how to create it efficiently and then control it after they have it—are also described. Professor Enrico Fermi and Drs. H. L. Anderson and Leo Szilard, of Columbia University, report that by bombarding uranium with slow neutrons they obtain a 20 per cent. gain in the number of neutrons emitted. This is evidence—slight but probably real—that the splitting of uranium, with its enormous release of atomic power, is probably accompanied by a chain reaction that creates more neutrons to produce more uranium fissions, and so on. The whole question of atomic power is still in the balance, for the experiments have yet to give a conclusive answer. The Columbia results are more conservative than reports which have come from France. Another new finding is the study by Drs. J. C. Mouzon and R. D. Park, of Duke University, on the delayed emission of piercing gamma rays from uranium excited by neutrons. Taking Wilson cloud chamber photographs of the bombardment out of a great number, one highly interesting picture was obtained. This may be the first evidence yet found of a multiple fission of uranium. Previously it has been shown that uranium can be split into two parts by neutron bombardment. The new pictures may reveal a splitting into three or more different products instead of into the usual two. More work will be needed to clear up this important point.

ADVANCES IN THE MEDICAL SCIENCES

WARNING that the drug, salfapyridine, used successfully in treating pneumonia, can damage dangerously the white blood cells is contained in a report in the current issue of the *Journal* of the American Medical Association by Drs. Nathan Rosenthal and Peter Vogel, of New York City. They found granulocytopenia in three children treated with the drug. Sulfanilamide also causes the trouble, and cases caused by sulfapyridine have previously been reported in adults. Careful tests of blood for possible danger signs are advised when the drug is being used.

A unique case of a Japanese beetle feeding on the ear drum of a man is reported by Dr. Max Kimbrig, of Huntington, N. Y. The legs or biting equipment of the beetle were stuck fast in the ear drum when Dr. Kimbrig removed it, and a large part of the drum was perforated. Dr. Kimbrig writes: "Since the Japanese beetle is herbivorous, it is difficult to understand his appetite for human ear drums. I have been unable to find in the literature any report of the destruction of an ear drum by a beetle that lives on plants."

The recent report of Drs. Fritz Kogl and Hanni Erxleben, of Holland, that they had found unnatural forms of amino acids in malignant tissues, is given notice in the *Journal* of the American Medical Association, an editorial stating that if confirmed by other workers and if all types of cancer tissues contain them "a new and fertile field for study into the nature of cancer will be opened."

Stating that vitamin F has not been established as a vitamin although it has been commercialized by firms marketing cosmetics, a committee of the American Medical Association has endorsed the elimination of the term by the American Society of Biological Chemists and the American Institute of Nutrition. Reduction of the number of vitamin A and D preparations is recommended. Even since the committee on vitamins made its most recent report, the *Journal* observes that "vitamin B_6 has been synthesized, the chemistry of vitamin K has been clarified to a considerable extent, and evidence has accumulated concerning the significance of these factors and of riboflavin in human nutrition."

THE CONGRESS OF AMERICANISTS IN MEXICO CITY

NEWS of prehistoric America—its buildings concealed beneath buildings; its fortune-telling mothers; its first, all-but-wild corn crops—the latest scientific discoveries on these and several hundred more angles of ancient Americans are being reported in a barrage of papers read before the International Congress of Americanists in Mexico City.

Discovery of a temple which has been concealed for hundreds of years beneath the famous lofty Mayan temple "El Castillo," at Chichen Itza, was reported by José A. Erosa Peniche. The stairway, façade and chambers of this ancient building, which Mayan Indian architects covered over to raise a higher, more impressive temple on the lofty pyramid base, were found by tunneling beneath the present structure, to avoid damaging it. Other archeologists told of probing other Indian monumental buildings in similar fashion, as Mexico burrows deeper beneath the visible present.

Mayan Indians, greatest scholars of ancient America, knew exactly when to introduce inter-calendar days necessary to keep their year in step with the sun, according to Erwin P. Dieselforff, of Copan, Guatemala. He states that eclipses of the sun were of major interest to these ancient American astronomers, explaining the Mayan method of forecasting when eclipses would occur.

Mayan Indian mothers consulted astrologers in their anxiety to know what good fortune or bad might be the destiny of their babies. Four of the lists of days and their omens, found in the books of Chilam Balam, have been studied by Alfredo Barrera Vázquez, of the National Museum at Mexico City, and he has concluded that the custom of guarding babies' fortunes by giving them calendar names up to a certain age was used by Mayan mothers of Yucatan, as well as by those in Indian nations of Mexico proper.

Tackling the much-argued question of when the first corn was raised by the first New World farmers, Pablo Martínez del Rio advanced the theory that agriculture may have had a more rapid rise in America than in the Old World. Differences in methods of seed selection and cultivation, he believes, speeded up results for Indian farmers, so that it is not necessary to conclude, as some botanists have, that American Indians must have started on their road to higher civilization an extraordinarily long time back.

The newest excavations at Monte Alban, Mexico, scene of the discovery of a Treasure Tomb a few years ago, have demonstrated who built the mountain-top city. Indians of the same cultural heritage built both Monte Alban and the remarkable valley city of Milta not far away. Architectural ideas are the same in both cities, according to Dr. Alfonso Caso, director of Monte Alban excavations. Three stages of Monte Alban's ancient history have been traced, and can be linked in time with Mexico's cultural stages of the Archaic, older than the Christian era, then Teotihuacan or Toltec, and Aztec.

The effort to find out what was going on in different parts of Middle America, during its great Indian era, have led archeologists to explore pit tombs near Guatemala City. Dr. A. V. Kidder, of the Carnegie Institution of Washington, reported finding that these tomb-builders were living while Monte Alban in southern Mexico was in its middle stage, and the great Toltec Indian civilization in central Mexico was nearing its decline. Pottery from the Guatemalan tombs provides the key for linking the tomb builders with other tropical American cultures and drawing Central America more closely into the picture.

Success in finding one of the missing stone statues from Tiahuanaco, Bolivia, which a French traveler carried off to Europe a century ago, was reported by Henri Lehmann. Modern investigators have never seen these statues, he said, but one of them, a statue combining human and animal features, has been found and placed at the Gate of the Sun in Tiahuanaco.

CORAL REEFS IN THE PACIFIC

CORAL reefs 1,200 miles long, extending as far as 150 miles from the coast line and sheltering huge clams four feet long and weighing more than a hundred pounds, were described by Professor C. M. Yonge, of the University of Bristol, England, speaking before the Sixth Pacific Science Congress meeting at Palo Alto on August 9.

"No ocean contains so rich a growth of coral reefs as does the Pacific," he told the congress. "Fringing reefs bound the land within the tropics especially along its western shores and atolls are scattered far and wide throughout the South Seas. But the greatest coral formation of all is the Great Barrier Reef of Australia. This immense series of reefs extends along the northeastern shores of Australia from the tropic of Capricorn in the south almost to the shores of New Guinea in the north, for a total distance of more than 1,200 miles. It is made up of thousands of individual reefs which extend in places as far as 150 miles from the coast."

The biology of the corals which form these reefs was examined by the Great Barrier Reef Expedition, which worked for more than a year in 1928–29 on a small coral island midway between the outer reef and the mainland.

"Corals are essentially sea anemones which have acquired the power of forming massive limey skeletons," Professor Yonge explained. Many grow to a great size, forming colonies which may be rounded and massive, branching and tree-like, or flat encrusting sheets, according to the region where they grow. Corals of the first type are found especially on the exposed outer surface of reefs, those of the second type in sheltered water in the lee of reefs, and of the third type on the summits of reefs where the surf sweeps over when the tide is out.

"Corals are all carnivorous. They feed, usually by means of delicate tentacles armed with batteries of stinging cells, on the minute animals which drift in the surface waters. Most corals only expand by night when alone; this animal life is abundant near the surface.

"Within their tissues are contained countless numbers of minute plants called zooxanthellae. It had been thought that these contribute to the food of corals, but this was found not to be the case. They do automatically remove

the waste products formed by the corals and in this way probably aid in the remarkable rate of growth possessed by corals. These can frequently double the bulk of their skeletons in six to twelve months, and it is this rapid growth which has made possible the formation of reefs many miles in length, of great depth and thickness, which are capable not only of resisting the destructive action of the Pacific breakers, but of actually growing out against the full fury of the sea.

"Corals are among the most successful and most highly specialized of all marine animals and different kinds of corals are adapted for life in all regions of the reefs. On and in the reefs live an immense and diverse assemblage of animals and plants of all kinds and many, notably the fish, of great beauty. The most spectacular of all are the giant clams which may attain a length of more than four feet and which weigh more than a hundred-weight. These gigantic 'cockles' are the largest bivalve shellfish ever evolved."

NEGROES AND INDIANS IN COLOMBIA

A RACIAL struggle in America fought, not with guns, but in biological terms of the survival of the fittest, is being won in northern South America by African Negroes.

Losers in the struggle, Choco Indians of the Pacific coast of Colombia, are apparently doomed to extinction, according to the report of Dr. Robert Cushman Murphy, of the American Museum of Natural History, to the *Geographical Review,* the journal of the American Geographical Society. In one section of Choco country there is now one Indian to every 160 Negroes.

Calling the Negro "the fittest heir of the Choco," Dr. Murphy states: "Transplanted from Africa, the Negro has become, as regards survival, a 'native' superior to his predecessor, even over the obstacle of a greatly inferior sanitary code."

Dr. Murphy points out that the African is more resistant to white man's diseases than the Indian. Also, the African's traditional "million years" of selective evolution in the hot and humid Congo may help to explain why the Negro in Colombia's tropics thrives, while the Choco Indian with a mere 10,000 years of tropical heritage, at the most, is retreating farther into the interior and dwindling in numbers.

Psychological and psychic weapons of the struggle give the African another advantage. The Negro considers himself a Colombian, and the Indian a savage. This attitude stems from the Negro's association with white men, and his adoption of the Spaniard's language and attitudes. Magic power of the Negroes is held in universal awe by the Indians, who fear evil eye power that supposedly can kill fish by a glance or cause children to fall ill. Indians, on their side, arouse fear in the Negroes by their lore of poisons, and their handling and "planting" of deadly snakes to do harm. But the psychic advantage, Dr. Murphy concludes, is on the Negro's side. One of the most horrible demons in Choco Indian lore has taken on the guise of a Negro.

ITEMS

THE nation's infantile paralysis chart, closely watched by the U. S. Public Health Service, shows a rise for the week ending on August 5, when 208 new cases were reported. This figure, however, is well below the median of 250 cases, which might be expected in the height of summer for this disease. South Carolina reported 17 cases, California 57, Michigan 49, New York 13. Early September will see the disease start a downward curve, according to twenty years' observation of its summer course.

THAT the entire diameter of the sun is now covered with a band of sun-spots is disclosed by new photographs taken at the U. S. Naval Observatory. The band is about evenly distributed north and south of the sun's equator and consists of eight groups with two sun-spots to each group.

THE Smithsonian Institution has acquired an implement that had more to do with the winning of the West even than Daniel Boone's famous long rifle. It is the first steel plow forged by John Deere at Grand Detour, Ill., in 1837. Made of an old sawmill saw because other suitable steel was lacking, it was able to shear through the tough roots of the prairie grasses that balked the relatively feeble Eastern-type plows which the pioneers had brought with them. The reputation of blacksmith John Deere's steel plows spread, and presently he and his partner gave up general blacksmithing altogether and became specialists in plow manufacturing. In 1846 they turned out 1,000 sod-breaking plows—a mass-production figure, for those days.

THERE'S no metal from heaven in evidence inside the huge meteor crater in Arizona. All metal must have spattered outside when the meteorite crashed to earth, according to Samuel G. Gordon, Philadelphia Academy of Natural Sciences geologist, who has just returned from an expedition to study America's biggest "shell-hole." About 15 tons of fragments of the meteor, ranging from a few ounces in size to half a ton, have been found in a radius of several miles. Mr. Gordon found that the crater itself, several hundred feet deep, is filled with about 80 feet of sediment. Shells of existing types of water creatures in the sediment indicate that the meteor struck thousands of years ago, when the region was less dry. Mr. Gordon will supervise the making of a scale model of the crater for the exhibition of the academy.

A SINGLE determination of high lead content of blood or urine can not be considered a diagnostic sign of lead poisoning although it may be indication of it, according to Professor R. A. Sawyer, Dr. R. W. Waggoner and A. A. Erickson, of the University of Michigan, in a paper read before the conference on spectroscopy at the Massachusetts Institute of Technology. They reported spectroscopic analysis of about 1,000 samples, with every one showing measurable lead and typical random distribution. Seven apparently normal persons showed high content, while two definitely known cases of plumbism showed only average content. The findings were further complicated by day-to-day variations over wide ranges. There is, however, some correlation between average lead content and occupational exposure. The concentration in samples from painters, for example, was almost double that of white collar workers.