SCIENCE NEWS

Science Service, Washington, D. C.

FREE POSITIVE ELECTRONS

"POSITRON" is the name with which the newly discovered positive electron will be christened by its discoverer, Dr. Carl D. Anderson, of the California Institute of Technology, Pasadena, as soon as the existence of the free positive electron becomes fully established. Dr. Anderson announced in SCIENCE last September the existence of the positive electron from cosmic ray studies, and experiments in Cavendish Laboratory, Cambridge, have just confirmed his work.

When the London correspondent of Science Service cabled the news of the confirmation by the British physicists, the news was specially relayed by telegraph to Dr. Anderson with the suggestion: "Why not christen your new particle 'positron'?"

"With regard to your suggestion," Dr. Anderson wired in reply, "we have already discussed here negatron and positron.

"Historically and derivatively the word, electron, denotes the unit charge, positive or negative, without any reference to the associated mass. The discovery that there exists a positive charge which, like the free negative electron, is unassociated with any mass of atomic magnitude, requires the introduction of a new term to distinguish it from the proton which is used to denote the positive electron associated with the mass of the atom of hydrogen. We have been discussing in the laboratory for some months past the desirability of calling the free positive electron, positron, and then using the similar contraction, negatron, for the free negative electron. This makes a logical and systematic notation which should be introduced if and as soon as the existence of the free positive electron becomes established.

"If the observations obtained here, part of which are already published, are actually due to positrons then we have new experimental evidence that in passing through matter positrons lose energy more rapidly than do negatrons."

The demonstration of the existence of a positive electron, as a fundamental particle of matter, positively charged but with the mass of the familiar negative electron, throws atomic structure theory into at least a momentary state of confusion. And since the positive electron was found in cosmic rays it may prove to be helpful in explaining the nature of this radiation.

Physicists are presented with the fourth of the fundamental particles of matter or bricks out of which atoms might be built. Two years ago there were only two, the positive particle, or proton, and the negative particle, or electron. In 1931, Dr. J. Chadwick in the Cavendish Laboratory of the University of Cambridge forged the last link in the chain of experimental evidence for the reality of the neutron, the close combination of electron and proton that carries no electrical charge. Now out of the same famous laboratory, presided over by Lord Rutherford of Nelson, has come the demonstration of the reality of the positive electron, confirming the suggestion issued last September by Dr. Carl D. Anderson as the result of cosmic ray track photography in Dr. R. A. Millikan's laboratory at the California Institute of Technology.

WATSON DAVIS

REPORTING EARTHQUAKES

CHINA'S Christmas earthquake disaster, whose 70,000 deaths in Kansu Province are just being reported by cable, after the news had slowly filtered out of the interior, sent its own reports by much faster methods, and they were read and correctly interpreted by scientists on the day of the catastrophe itself.

Within a few hours after the earthquake occurred, eight seismological stations in widely separated parts of the world wired and radioed the facts of their instrumental records to Science Service. Investigators at the U. S. Coast and Geodetic Survey interpreted the data, and stated that they indicated a "very severe earthquake that was probably extremely destructive to life and property" in the interior of China. The latitude and longitude as thus calculated correspond exactly with the locations now being reported by cable.

This is the second time that a disastrous earthquake in that same region has sent its own report, via the sensitive instrument in seismological observatories, weeks ahead of the delayed cable news. On May 22, 1927, an even greater catastrophe, in which a hundred thousand Chinese perished, occurred in Kansu, and within eighteen hours its location had been determined and the statement made that loss of life and property would probably be very heavy. At the end of July, a missionary priest finally found his way through a ruined and bandit-infested region to a telegraph wire and sent the first verbal confirmation of the scientists' prediction.

Similar "beats" have been scored by scientists and seismographs over reporters and telegraphs in several other notable earthquakes during recent years. Data for these reports are gathered by Science Service and interpreted by the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association, acting in cooperation with many seismological observatories in universities and other institutions in the United States and foreign countries.

In the case of the Chinese quake, the first wave was recorded on the nearest reporting seismograph, that of the Philippine Government Observatory at Manila, 6.5 minutes after the quake started in China. The second wave arrived 10.9 minutes after the shock. The difference in time between these two records indicated to scientists of the U. S. Coast and Geodetic Survey that the quake was about 2,220 miles from Manila. Similar time gaps were interpreted to signify distances of 4,200 miles from Strasbourg, in Alsace; 4,470 miles from West Bromwich, near London; 7,020 miles from the headquarters of the Jesuit Seismological Association in St. Louis, Mo., and 8,250 miles from the U. S. Coast and Geodetic

Survey observatory in San Juan, Puerto Rico. Similar reports were received from Tucson, Arizona, and the University of Vermont, Burlington, Vt. All the data were relayed through Science Service, which acted as a clearing station.

THE PREVENTION OF RANCIDITY BY MALEIC ACID

MALEIC acid, a cheaply and easily produced synthetic compound, has been found to be a good thing to add to edible fats and oils to keep them from getting rancid. Dr. G. R. Greenbank, of the U. S. Department of Agriculture, who made the discovery, has applied for a public service patent on its use for this and similar purposes, which it is expected will be granted soon. Under such a patent, the product can be used freely by anybody, and no one can establish a monopoly.

Dr. Greenbank was led to his discovery by a project in chemical research, with the object of finding why some oils and fats kept naturally better than others. He did not succeed in learning this, but did learn that the natural "better keepers" had extremely minute quantities of unidentified organic acids in them.

Then he tried adding acids of known composition to oils and fats, and soon found that maleic acid, added in a proportion of one part to ten thousand of the oils to be preserved, would enable it to stand without turning rancid for about three times as long as untreated samples of the same oils. The better the quality of the oil the longer it would be preserved by the maleic acid; the best oils had their natural life extended five times instead of the average three.

Dr. Greenbank has tried this method on many fats and oils used as food and in the industries, including butterfat, butter, lard and the oils of cottonseed, peanuts, corn and sesame. He has also tried it on such food products as milk powder and pie-crust, and he believes it will be useful in the cereal industries.

The chemistry of maleic acid's efficiency in preventing rancidity is not yet known. Dr. Greenbank thinks it possible, however, that it operates by stopping the formation of peroxides, which are intermediate steps in the respirational-digestive processes of the bacteria and other fermentive organisms that oxidize fats and oils, thereby splitting off the acids that give them the rancid odors.

Maleic acid is chemically related to malic acid, one of the mild acids found in apples and other fruits. It can be made from malic acid, though in commercial practise it is obtained synthetically in other ways. At present it is made by the chemical firms manufacturing photographic reagents, who make it so cheaply that they can sell it for a few cents an ounce.

ITEMS

A COMET that may become visible to the unaided eye was discovered early Thursday, February 16, in the northern evening sky by Leslie C. Peltier, an amateur astronomer of Delphos, Ohio, the Harvard College Observatory has been informed. It is at present eighth magnitude and sufficiently bright to be visible through small telescopes or high-powered field glasses. It lies between the constellations of Cepheus and Cassiopeia in the region of the Milky Way and it is moving southeastward. Further observations may be expected to show whether the comet is a newcomer to the heavens or an old comet returning to the vicinity of the sun. Mr. Peltier is a veteran comet discoverer. He reports the astronomical position of his latest discovery as right ascension 22 hours 48 minutes and north declination 62 degrees.

FOSSIL bones of a forty-foot plesiosaur, the largest and most complete specimen ever found in Australia, have been brought back to the Harvard Museum of Comparative Zoology by William E. Schevill, who has recently returned from an eighteen-months' expedition to that country. The bones are now being examined and prepared for permanent mounting.

CANCER will soon be treated at Mercy Hospital, Chicago, with a giant x-ray tube, with a voltage of 800,000 and a radiation output equivalent to radium worth $75,000,000. The new tube is about to be shipped from the General Electric laboratories, Schenectady, New York. The new 800,000-volt tube has several times the energy rating of the cancer-treating tube installed about two years ago in Memorial Hospital, New York. The tube itself is 14 feet long and it is being installed in such a manner as to assure the comfort and safety of patients and the hospital staff.

FISH livers have a new use—as treatment for pernicious anemia. This is announced by Professor L. S. P. Davidson, of the University of Aberdeen, in a report to the *British Medical Journal*. Professor Davidson found that an extract from livers of cod, haddock and whiting is effective in treating pernicious anemia. Beef liver is now widely used for this purpose.

"LACE CRABS," strange, delicately-constructed fossil creatures that lived in the primal seas half a billion years ago, may have been merely the "soft-shell" stages of trilobites, extinct relatives of lobsters and crayfish that dominated the waters of that long-gone epoch. This new solution for an old riddle of geology has been suggested by Dr. Rudolf Ruedemann, of the New York State Museum. Working with a specially constructed microscope, Dr. Ruedemann has found evidence that the "lace crabs" had shed an outer shell, as lobsters and crabs shed their shells to-day. In this "soft-shell" stage they looked like creatures of an entirely different order, with wide-apart eyes on their unprotected heads, and the delicate lacy limbs that have given this fossil group its name. The principal deposits of "lace crabs" have been found in fine-grained shales, hardened out of the mud into which the unprotected moulting trilobites settled for shelter while their new shells were forming, and where many of them were trapped and killed by pockets of water over-charged with carbonic acid. The "lace crabs" were first described by the late Dr. Charles D. Walcott, secretary of the Smithsonian Institution. Dr. Ruedemann's suggestion that they were "soft-shell" trilobites is set forth in a recent Smithsonian publication.