SCIENCE NEWS

THE PRODUCTION OF RUBBER

Science Service

SCIENTISTS see a challenge to American ingenuity in conditions revealed by a meeting at Washington of leading raw rubber consumers to protest against restrictions placed by the British on rubber exports from the Malay Straits. America, which uses about three quarters of the world's rubber, should establish sources independent of the British monopoly. British planters now virtually control ninety per cent. of the world's raw rubber.

In the Philippines there are a million acres of potential rubber plantation land on which Para rubber could be raised on the same system used by the British and Dutch in the East Indies. Philippine land laws which restrict holdings to no more than 2,500 acres stand in the way, and American manufacturers have been afraid to start plantations in the Philippines because of the uncertainty of their political future. The British and Dutch have built up the plantation rubber industry with cheap and plentiful coolie labor. In South America, the original home of the raw rubber trade, the supply comes from the rubber trees which grow wild, and there, too, the relative scarcity and high price of labor prevents the cultivation of these trees in competition with the coolie labor used by the Dutch and British in the far east.

In Central America, the rubber is obtained from a different tree, Castilla, but this tree can not be tapped repeatedly as can the South American tree, Hevea, which the English and Dutch have brought under cultivation in the far east.

Agricultural experts here, however, think that there is a possibility of raising rubber from this Central American tree under the typical American system of extensive farming with little labor, in much the same manner that the turpentine and rosin industry is carried on in our southern states. They say that the trees could be planted, left to themselves and then tapped to destruction, or the trees cut down and all the rubber milk extracted and the wood then used for paper or other purposes. The land is available and experiments should be carried on to determine whether such a system offers a solution to rubber raising in this hemisphere in competition with the cheap coolie labor of Asia.

Not only may this be done, but great supplies of low grade rubber, although lacking the elastic properties of the material obtained from the South and Central American trees, can be obtained from a number of plants of this country and Mexico. This rubber, mixed with the more elastic product, forms a product of greater strength than the pure South American or Central American rubber.

Guayule, a Mexican plant, has been utilized to furnish this class of rubber and scientists of the Carnegie Institution of Washington, who have been experimenting with rubber-producing plants in our southwest since the world war, called attention to the necessity of our having a home-grown supply. They have also found that the desert milkweed offers possibilities of development into a practical source. The stems of this milkweed, which grows in scattered clumps in the southwest, carry from two to six and one half per cent. of rubber. This is too low a yield to justify the growing of the plant on a commercial scale, but the nature of the plant indicates that this percentage can be materially increased by well-known methods of breeding and selection.

The fiber of this desert milkweed makes good paper. The paper yield is about thirty per cent. of the total weight of the dry plant. By using both the rubber and the fiber, they point out, it may become an economically important plant, not only helping to furnish a home-grown rubber supply, but also putting to use vast extents of land now lying idle in our western states.

Brazil up to 1910 had a monopoly on the world's raw rubber, obtained from the wild trees, and maintained by restrictions against the export of the seed of rubber plants. In 1876, however, an English scientist smuggled a shipload of seed to England. From botanical gardens there, seeds were sent to Ceylon and the foundation of the plantation rubber industry of the far east was laid. Rubber trees were scientifically bred and trained, like cows, to give greater quantities of milk.

It was the growth of the automobile industry in America, however, which created the tremendous demand that enabled this infant industry to outstrip the wild rubber of South America, and made the center of the world's rubber industry bounce to the other side of the globe. But the supply grew faster than the demand, and in order to keep up profits, the British imposed an export tax last November to limit production. The demand is still growing, however, and threatens to again overtake the supply, while the British restrictive measure, it is estimated, will at present cost add $200,000,000 to the bills of automobile owners and other rubber consumers. Further advances may send prices still higher.

THE MANUFACTURE OF NITRATES

Science Service

FRANCE will eventually be independent of Germany for nitrates in time of peace, and will be self-sustained in this respect in war time if the bill now before the Chamber of Deputies authorizing the convention with the Badische Anilin und Soda Fabrik becomes a law. The convention gives to the French possession of the secret of the Haber process used by the great German chemical company for the production of ammonia from the nitrogen of the air.

It is admitted that the German interests gave their approval only under pressure from the French, although it is denied that any threats to actually steal the secret by force were made. According to the convention, German engineers will help install at the French plant to be constructed at Toulouse the process which was in use at the great works at Oppau which were recently blown up by an explosion. French engineers have already been able to inspect the German factories where the method is used.

The estimated cost of the projected plant at Toulouse is approximately $5,000,000. It will supply 36,000 tons of nitrates a year which, although hardly more than a third of the total French consumption, will make the country much more nearly self-sustaining than it has been hitherto. With the secret in possession of the French the process may be developed in other localities than Toulouse.

The secret process concerns just what substance was used as a "catalyser" to effect the chemical union of the free nitrogen from the air with the hydrogen which is mixed with it under pressure. A "catalyser" is in chemical industry what a man who is "the life of the party" is in a social gathering. He may not do much himself but he brings interesting folks together and starts something. No one knows just how a "catalyser" works, but when two unfriendly substances are brought together in its presence under the right conditions it causes them to unite. The Badische company had discovered such a go-between for nitrogen and hydrogen which enabled them to bring them into chemical combination more cheaply than by most other methods.

NEW STARS

Science Service

REPORTED observations from Paris of an extraordinary increase in brightness of the star Beta Ceti are not confirmed by the astronomers at the Mt. Wilson Observatory, which is the best equipped institution in the world for spectroscopic study.

According to Dr. W. S. Adams, acting director, there has been no certain increase in brightness and definitely none whatever in the spectrum of the star. The latter statement is of especial importance as sudden increases in brightness of stars are accompanied with marked changes in the spectrum.

Dr. Adams thinks the star may have been confused with one of its near neighbors in the constellation of the Whale, Mira Ceti. This is a variable star and was known to the ancients as the "wonder star." It fluctuates in brightness over a period of 331 days and is now at its brightest, being somewhat fainter than the Pole Star. There is no evidence at the Mt. Wilson Observatory for such an outburst of brilliancy on the part of Beta Ceti as was heralded all over the world on the authority of Camille Flammarion, the French astronomical writer. Even if the star had increased in brightness enough to raise it from the second to the first magnitude, it would not imply, as the Paris despatches stated, that its heat had been raised ten or fifteen times.

Variable stars and new stars, that is, stars which increase suddenly in brightness, are familiar to all students of astronomy. Several "novæ," as these "new" stars are termed, have been observed in modern times. The most recent was the one known as Nova Aquilæ III, which became a notable object in the skies during the summer of 1918.

Known for centuries as a quiet, unobtrusive little star, visible only through telescopes of fair power, this star suddenly went on a rampage and in the space of a day blazed up to a brightness only exceeded among the stars by that of Sirius, the brightest of all and the most striking object in the midwinter southern sky. After a few days of this brilliant performance the star lost its pep and by October had again faded from the sight of the unaided eye.

Another notable example was Alpha Persei, which about twenty years ago suddenly increased from the brightness of a dim star to one of the first magnitude and like the others of its kind slowly faded again into insignificance. A star in the constellation of the Swan which had been so faint as to be barely visible through a high power telescope also jumped into the spotlight by a similar performance in 1920, although it never achieved more than the second magnitude of brightness.

The cause of these "novæ" is a matter of dispute among astronomers, but the best opinion is that because of their lack of permanence they

are due to effects merely on the surface of the orb. There is an immense amount of heat thrown off, and the diameter of the star becomes enormously increased due to the uprushing at inconceivable speed of vast masses of incandescent gas.

INFLUENZA AND THE DEATH RATE

Science Service

THE current epidemic of influenza and pneumonia has been largely responsible for an increase of nine per cent. in the death rate for January over that of a year ago, according to the monthly statement of the Metropolitan Life Insurance Company. The rate was 10.5 per 1,000, which is higher than for any January since 1919, when the country was in the later phases of the great epidemic of influenza. Deaths from automobile accidents are the highest of record for January.

The relatively high mortality of the month was due largely to the increased death toll of influenza and pneumonia, together with higher rates for important organic diseases such as heart disease, cerebral hemorrhage and Bright's disease. The present influenza outbreak, like prior ones, has been indirectly responsible for higher mortality from these organic diseases.

Unusual prevalence of influenza was first observed in several southern states—more particularly, the Carolinas, Georgia and Tennessee. It now appears to have passed its peak in these states, but is developing not only in a number of adjacent sections (Maryland, District of Columbia, Kentucky and Louisiana) but in other parts of the country, for example, Maine, Connecticut, New York, New Jersey, Ohio, Illinois, Michigan, Wisconsin, Nebraska, Kansas and Texas—and, to a lesser extent, in Wyoming, New Mexico, Oregon and California. Pronounced increases in the number of cases and deaths have been recorded in cities located near the southern border like Baltimore, Washington and Cincinnati. Chicago, Columbus and Detroit in the middle west are reporting many cases. In New York City, the influenza and pneumonia mortality rate has likewise risen.

Very decided increases as compared with January, 1922, have also been recorded in the death rates for measles, whooping cough, tuberculosis, accidents—and more particularly, automobile accidents. The month's death rate for the last was 10.8 per 100,000, the report states.

"This marks, not only a pronounced rise over last year's January rate, which was 9.0; but stands as the highest January figure ever recorded for this type of accident. It is discouraging indeed to announce that, bad as the automobile accident situation has been in recent years, present indications are that it is growing worse. The automobile fatality situation is the foremost public safety problem of the present day."

SUCCESS OF FISHERIES DEPENDENT ON BALANCE OF LIFE

American Museum of Natural History

COMMENTING upon the agitation in various western papers regarding the destruction of salmon by sea-lions, Mr. John T. Nichols, of the department of ichthyology of the American Museum of Natural History, says that the balance of life in the ocean is a very intricate and delicate one. On this balance depends the abundance of any particular kind of fish. As the success of any fishery is in turn directly dependent on the abundance of the fish which it involves, the economic importance of knowing about the balance of ocean life is at once apparent. Unfortunately, up to the present, our knowledge of ocean life is still meager in comparison to that which is still to be found out and concerning which we are obliged to rely on hypothesis. It is of the greatest importance that this fact should be realized by those interested in the conservation of our fisheries, to the end that ocean research shall have their support.

Failure to realize that this problem exists is one of the causes for bringing forward perfectly ridiculous explanations of the depletion of fisheries. The claim that sea-lions are destroying the salmon fisheries of the Pacific Coast is a good example. As a mattter of fact, where salmon are the most abundant and available fishes in the sea, it is true that sea-lions eat them in large numbers and can swallow the large ones whole. Sea-lions have been taken at the mouth of the Columbia River literally filled with salmon, except for the one or two big cobble-stones which are ordinarily to be found in a sea-lion's insides, and which he is probably tempted to swallow, although he does not know it, because they will churn around and help to grind up the fishy content of his stomach. Nevertheless, it should be sufficient to dispose of the sea-lions as the active agent in the reduction of the salmon supply to call attention to the fact that they were unquestionably in the field, and as destructive, in the days of the redmen, when these same fishes were everywhere present on that coast in enormous numbers.

History tells us that the Atlantic salmon entered rivers abundantly as far south and west as the Hudson in the early days. Although a few are still taken to the eastward in the vicinity of Buzzard's Bay, a few small individuals perhaps being found there every year, salmon have become practically non-existant south of the long sandy

arm of Cape Cod. Northward from that point, where seals are comparatively numerous, they still exist in varying numbers. The disappearance of the Atlantic salmon from our waters is mentioned here because it is a case that can be explained very easily. From Rhode Island to New Jersey there are no longer any rivers sufficiently free and unpolluted to be suitable for it to enter and spawn. This pollution, which has wiped out the salmon from the area, has doubtless been of indirect harm to sea fisheries also. The alewife, a kind of herring, formerly entered all its small streams to spawn in spring in vast numbers, and these alewives, on returning to the sea, were a rich food supply which attracted such fish as the cod. Alewives are no longer able to use many of their ancestral streams, and their legion has dwindled to insignificance. This alone would account for a lesser abundance of cod and haddock.

The examples cited give little idea of the intricacies of the problems which remain to be worked out. Human interference, and especially commercial fishing, doubtless menace the fish supply all along the line, but so great is the productivity of the ocean that, on the other hand, a still greater development of commercial fishing is probably possible without "killing the goose that laid the golden egg," provided it is regulated with due consideration for the balance of life which exists in the sea, and checked where it presses on sensitive points. It is as fallacious to shout "over-fishing" whenever a given fish decreases in numbers as it is to shout "sea-lions" when the catch of Pacific salmon falls short of the expected.

ITEMS

Science Service

THE reported finding in Patagonia of a fossil skull alleged to be that of an ape-man who lived there about a million years ago is scouted by leading anthropologists as highly improbable. The consensus of opinion based on scientific evidence indicates that the Americas were not inhabited by human beings until comparatively recent times and the first men here were close relatives to Indians now living. No early men, corresponding to the primitive cave-man types of western Europe, have ever been found on either of the two American continents. The first discoverers of America reached this continent at a much later date and represent a much more highly advanced human type than these cave-dwellers. Reports of findings of prehistoric remains alleged to be of great antiquity have been frequent, but have all proved either much younger than claimed or not the remains of man at all but merely peculiar rock formations roughly resembling the shapes of heads and other human remains.

DR. ALEŠ HRDLIČKA, anthropologist of the Smithsonian Institution, gallantly has come to the rescue of the prehistoric lady whose skull has just been reported found in the English Channel island of Jersey. This female is probably much younger than cable dispatches from England would indicate. It is not surprising that a cave-woman skull should have been found in Jersey, said Dr. Hrdlička, who is well acquainted with the island and its remains of ancient man. About fifteen years ago the teeth of a primitive man belonging to the Neanderthal period were found and prehistoric implements and other remains are plentiful there. The age of such remains can, however, be only roughly determined from the sediment in which they are found. He thinks it unlikely that the female skull found near the Jersey village of St. Owen is anywhere near so old as the Java ape-man remains known as *Pithecanthropus erectus,* or even the Piltdown jaw found in England. Although man in western Europe dates from very early times, going back from 50,000 to 150,000 years, none of the low-browed skulls of early man is nearly so close an approach to the apes as the Java skull which has been estimated to be 500,000 years old.

A SCIENTIFIC plan for the future development of New York City, more thorough and comprehensive than anything of the kind ever before attempted, and including all the territory within fifty miles of Battery Park, is being begun by a committee of experts appointed for that purpose by the Russell Sage Foundation. The committee is known as the "Committee on the Plan of New York and its Environs." All suburban territory will be divided into six sections and one expert will make a particular study of its problems and of their relation to the whole plan. The survey will include consideration of every phase of city life with special reference to housing, transportation, zoning and recreation. The ultimate object is the decentralization of New York to the greatest practicable extent, possibly through the creation of self-contained suburbs or "satellite towns" whose inhabitants will find opportunities for work, education, religious observance and recreation without going to the center of the city. A preliminary report will be made on October 1.

THE chemical faculty of the University of Chicago is soon to broadcast chemical lectures by radio.

THE bones of an ape which had been confined in a Theban temple some 2,000 B.C. have furnished the first known example of rickets.