SCIENCE NEWS-LETTER

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AUTOMOBILE ENGINE NOW USES HEAVY FUEL

Paris Heavy oil can now be used as automobile fuel. Recent experiments with improved motors of the Diesel and Semi-Diesel type demonstrate the practicability of using heavy oils in place of gasoline for the propulsion of motor vehicles. Due to the high price of gasoline in France which at present averages about 80 cents a gallon and threatens the supremacy of gasoline as a universal motor fuel, the new motor, known as the Peugeot of the Semi-Diesel type, has been perfected by M. Tartrais, the noted French inventor. Heavy oils such as kerosene, vegetable oils, etc., can be used in this motor and the cost of operation is thus greatly reduced.

The new engine has a two-cycle motor with two cylinders operating at practically constant volume. The compression chamber is constructed of nickel chrome steel on account of high temperatures developed. The instantaneous starting system includes an electrically heated platinum spiral which is thrown out of use after normal running.

M. Tartrais' new motor differs from the Diesel type of motor inthat the cylinders are made to work six times as fast and for this reason the motor becomes six times lighter. While the Diesel motor is capable of about 250 turns per minute the lighter engine is capable of 1600 revolutions per minute.

Diesel engines in the past have been used chiefly for installation in stationary power plants. On account of their great weight many are used on submarines, though considerably lightened in weight, and even locomotives have operated by these motors to advantage. Where the element of weight is no consideration the Diesel motors

have had wide application to industry and commerce. The economy and simplicity of the Peugeot motor entitle it to very serious consideration and adoption, experts say.

Ignition of the heavy fuel oil is accomplished by the use of an efficient atomizer, by the high temperature of the lateral walls of the toric chamber which are red hot in normal running, and by producing a vigorous and methodical mixing of the oil droplets with the air. A new and efficient atomizer plays the same part as the injector in Diesel motors and forces the heavy oil into the compressed air of the combustion chamber in very fine droplets. It consists essentially of a valve which closes a tube having sharp edges which acts as a valve seat. The Peugeot motor employs an auxiliary compressor where the oil is atomized under high pressure between the valve and the sharp edges of the valve seat, this action being aided by a strong current of gas. To break up the atoms of oil the necessary high pressure is produced by a pump furnished with a plunger piston. Both the pump and its pipes and the atomizer are entirely filled with oil, thus avoiding the use of compressed air. Two spark plugs are employed to ignite the mixture as in the case of gasoline aviation motors whose cylinders sometimes develop 50 horse-power. The explosion starting from two points thus spreads very rapidly through the mass of combustible mixture and gains a 5 to 10 per cent increase in power.

BROADCASTS

Radio News of the Week

RADIO CONFERENCE
CONSIDERS LEGISLATION

Washington. The radio conference called by Secretary of Commerce Hoover is now considering legislation which when passed by Congress will put into effect its recommendations for controlling radio telephony and telegraphy. The experts on radio reconvened at the call of Dr. S. W. Stratton on Monday (April 17) and went into executive session.

The conference is also considering the criticisms and suggestions that resulted from publication of its tentative report.

Representatives of the government departments who have been considering the way in which the government will use the wave lengths allotted to it have not yet announced their findings.

COMING - NEXT WEEK - EXTRA RADIO COPY ON HOW TO IMPROVE BUREAU OF STANDARDS 36. HOME-MADE RADIO SET (EXPLAINED IN STORY IN SCIENCE SERVICE REPORT NO. 48).

FIRST INTERNATIONAL MEETING
OF RADIO SCIENTISTS SOON

Washington. Plans are being made for a meeting this summer probably in July of the International Union for Scientific Radio Telegraphy which will bring together at Brussels leading radio experts of the various nations of the world. Scientific questions and cooperation between the research activities of different countries will be considered.

Dr. L. W. Austin, head of the Naval radio research laboratory, chairman of the American section and vice-president of the International Union, will be one of the American delegates.

SCIENCE OF GROWING THINGS

Agricultural News of the Week

FLOWERS, HAIR BRUSHES, FOOD
AND DRINK FROM CACTUS

Washington. Beautiful white flowers, hair brushes, flour, cattle forage, food and drink for man, building material, and fuel are a few of the products that can be obtained from the cactus, commonly considered to belong only to barren desert. And according to Dr. J. N. Rose, who has been studying the cactus family for the Carnegie Institution of Washington, cacti not only live on the desert but they can be found in the moist regions of tropical America.

"Although these plants have their most wonderful development in the deserts where they take on grotesque shapes and often are the most dominant feature of the landscape, yet they are able to adapt themselves to the conditions which are found in the great rain forests of Brazil," Dr. Rose says. "In these humid regions, however, the cacti grow on the bark of trees and thus have xerophytic conditions not unlike those found in the desert.

"Cactus furnishes the desert Indian not only food and drink, but also material for his home and fuel for his hearth. From some of the cacti is obtained a hair brush, from the seeds of others a flour is made and from another an emergency forage for cattle is secured.

"A cactus hedge more than half a mile long produces from six to ten thousand white flowers in a single night. Cactus has a remarkable armament of curious spines, some a foot long with strange hooks, and others that are very delicate and beautiful in their arrangement. The cactus is entirely confined to the Americas, extending from Alaska through Patagonia, from the Atlantic to the Pacific and from sea level to an altitude of over sixteen thousand feet. There are more than a thousand species.

ROME TO BE SCENE
OF SCIENCE MEETINGS

Washington. April 00.- Rome will soon be the center of international scientific activity due to the assembling of many delegates to the meetings of the International Astronomical Union and the International Union of Geodesy and Geophysics beginning May 2.

Reform of the calendar is one of the important matters on the agenda of the astronomers, while the establishment of a great fundamental longitude net of the world will be discussed by the geodesists. European survey officials will also discuss the combination and junction of the triangulation system of various European countries with a view to all the countries of that continent using the same map base as do Canada, the United States, and Mexico. Utilizing volcanic heat as a source of power as is being done at Larderello, Tuscany, is a project that will be discussed by the volcanologists. This would be undertaken by the sinking of bore-holes in regions of volcanoes and hot-springs. Hope is entertained also for international cooperation in obtaining news of volcanic eruptions.

What the upper layers of the atmosphere of the earth is composed of at a height of about 12½ miles is to be discussed by the meteorologists. Further investigations are to be planned as some investigators declare that the extreme layers are composed of hydrogen, while others say it is helium, and still others believe that it is geocoronium.

The following delegates from the United States to the International Astronomical Union have sailed for Rome: Dr. R. G. Aitken, Lick Observatory; Dr. C. E. St. John and Prof. F. H. Seares, Mount Wilson Observatory: Dr. H. D. Curtis, Director of the Allegheny Observatory; Dr. O. J. Lee, Yerkes Observatory; Prof. H. N. Russell, Princeton University; Prof. Frank Schlesinger, Yale University; Prof. John A. Miller, Swarthmore College; Prof. Edward Kasner, Columbia University; Dr. Harlow Shapley, director of the Harvard College Observatory. Dr. Frank B. Littell, of the U. S. Naval Observatory, will be the official representative of the U. S. Government.

Those who will attend the meetings of the International Union of Geodesy and Geophysics include: Dr. L. A. Bauer, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington; Dr. William Bowie, Chief, Division of Geodesy, U. S. Coast and Geodetic Survey; Prof. H. F. Reid, Johns Hopkins University; Dr. H. H. Kimball, U. S. Weather Bureau; Dr. G. W. Littlehales, U. S. Hydrographic Office; Dr. H. S. Washington, Carnegie Institution of Washington.

About twenty-five countries will be represented at these meetings.

The organizations that are meeting at Rome were formed in 1919 to take the place of the international scientific bodies which existed prior to the war. The new parent organization is the International Research Council, under the rules of which were founded separate unions of different sciences, among these being the International Astronomical Union and the International Union of Geodesy and Geophysics. Since the previous meeting of the Astronomical Union of 1919 at Brussels was devoted largely to organization and statutes the meeting this year at Rome will be principally on scientific matters.

GENUINE ATTAR OF ROSES
THREATENED WITH EXTINCTION

Washington. - Roses are yielding to tobacco in Bulgaria. The valley districts which lie at the foot of the Balkans produce more attar of roses than any other region in the world. But unless a check can be placed on a mysterious disease which has recently attacked the rose bushes there, the fragrant oil will become so costly that very few will be able to afford the luxury of the genuine odor. Many of the rose growers of Bulgaria have become alarmed at the inroads of the disease which threatens their property and their livelihood and have taken up the raising of tobacco instead.

The Bulgarian attar of roses is of a very fine quality, and sells for nearly $125 a pound wholesale in the European markets. In diluted form it is sold as perfume in the shops of Paris and London for five times its wholesale price. The fragrance of two thousand pounds of distilled rose petals is in each pound of the genuine attar. Cheaper perfumes are made artificially, but connoisseurs claim that there is a distinction in the scent and that the artificial variety is not so lasting

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PLASTIC WOOD
NOW MANUFACTURED

London. Plastic wood that has the consistency of pastry dough and can be readily molded into any desired form has recently been produced by a firm of Stowmarket, England.

It is formed from a nitrated cellulose dissolved in amylacitate and other solvents and kneaded with finely ground wood meal. Tenacious in character and capable of adhering to almost any surface except a greasy one, it dries within a few hours to a hardness similar to pear wood and can then be worked like real wood. Because of its plastic condition in the making it can be used in such various ways as pattern making, crack filling, and repairing damaged pieces.

NEWS OF THE STARS

Dark Nebulae in Space Not Far from Solar System,

By Isabel M. Lewis,
U.S. Naval Observatory,

Not only among the far-distant star clouds of the Milky Way but comparatively close to our own solar system there are vast absorbing tracts of dark nebulous matter adrifting through space.

It has been found that these obscuring nebulae, as they are called, cluster chiefly about two principal planes, the plane of the Milky Way, called the galactic plane, and the plane that is outlined by the bright helium or Orion stars. This latter group is flattened in shape like that of the Milky Way system of stars and is inclined to it at the small angle of ten degrees. It is to this secondary system outlined by the helium stars that our own solar system belongs. Many of the dark markings in the heavens, it has been found, show a decided preference for this secondary system.

According to the researches of Dr. A. Pannekoek of Leiden, Holland, the dark nebulae in the constellation of Taurus, which are included in Prof. E. E. Barnard's catalogue of dark markings in the sky, belong to this secondary system of stars to which the solar system belongs. They are, then, comparatively near to us.

Dr. Pannekoek finds that this dark nebulous region in Taurus is at a distance of about 450 light-years from the earth. This places it about four times farther away than the V-shaped group of the Hyades in Taurus. The lateral extent of this dark region is about 225 light-years, that is, light would take 225 years to cross it. One particularly dark oblong stretch has an extent of 65 by 23 light years and three small black objects, catalogued by Prof. Barnard, have diameters of 500,000, 40,000, and 30,000 astronomical units respectively. The astronomical unit is the distance from the earth to the sun or 93,000,000 miles, and the diameter of Neptune's orbit is about 60 astronomical units. Thus the smallest of these black objects is 500 times greater in diameter than the diameter of the solar system.

Assuming that the absorbing effect of the dark nebulous tract in Taurus is due to the presence of a vast gas-cloud shutting off the light from stars beyond, Dr. Pannekoek estimates that the total mass of the cloud is so great that the solar system must describe an orbit around it in apperiod of two or three million years. On the assumption that the absorbing tract consists rather of dust-clouds or small meteoric particles, that scatter light from stars beyond, such an enormous total mass for the nebula would not result and its attraction for the solar system would

be considerably less.

It is not known whether these dark nebulae are to be regarded as gaseous or meteoric in their composition. If gaseous their densities must average less than one-millionth of the density of air at sea-level. Otherwise they would possess a gravitational attraction so great that they would draw to them all of the neighboring stars in space.

It seems more likely, in view of the abundance of meteoric particles that are known to exist within the solar system, that these dark regions consist rather of swarms of minute meteoric particles. The solar system might even pass through the less dense portions of such a nebulous region without experiencing any more serious effects than, possibly, a slight temporary increase in the intensity of the radiation of the sun.

IOWA NATURALISTS OFF
TO FIJI ISLANDS AND NEW ZEALAND

Iowa City, Iowa. To make a study of the fauna, flora, and structure of coral reefs, a party of naturalists from the State University of Iowa will make an extended trip this summer to the Fiji Islands and New Zealand. The expedition is lead by Professor C. C. Nutting, head of the department of zoology, and other members are Professors R. B. Wylie and A. O. Thomas, Dr. Dayton Stoner, and Waldo S. Glock. Mrs. Stoner will be assistant entomologist of the expedition. The scientific data gathered will be compared with facts of similar expeditions conducted by the University of Iowa for the past thirty years.

A study of native boats, boating, diving and methods of fishing will be undertaken by Professor Nutting at Fiji. Professor Thomas will also investigate the phenomena of volcanism and elevated reefs, while Professor Wylie and Dr. Stoner will study the land flora and fauna.

A visit to one of the bird sanctuaries in the hot region in North Island and the Alpine District in South Island and the establishment of cooperative contacts with scientific men in New Zealand is planned.

PLAN ADOPTION OF "LUMINAIRE" INTO ENGLISH LANGUAGE

New York. The adoption of the French word "luminaire" into the English language to signify "lighting unit" is being recommended by the Illuminating Engineering Society. The lighting engineers say that this new addition has met with favor because it is used in this connection in the French language and can be adopted as readily as "garage", "hangar", "chef", "chauffeur" and other French words which have emigrated to America.

WATER KEEPS
BODY HEAT CONSTANT

Montreal, Canada. Water is the biggest factor in the operation of one of the animal body's wonderful automatic regulating mechanisms, the control of the healthy human temperature to within a few tenths of 37 degrees Centigrade or 98.6 degrees Farenheit in spite of widely varying conditions of environment. Prof. Henry G. Barbour, of the department of Pharmacology of McGill University here, with the assistance of M. Tolstoi, has been able to show experimentally how the mechanism of the heat control works, and he has also demonstrated that "temperature nervous centers" of the brain act as the thermostat of the body.

"When one enters a warm environment certain of the skin nerves 'feel hot'," says Prof. Barbour in explaining the mechanism. "They telegraph the fact to the lower regions of the brain. Slight overheating of the brainward bound blood will carry a similar message."

"What happens next? The message is relayed by nerves to various tissues where water is stored, and this water is released into the blood stream. This may be detected by weighing the solid matter in a sample of blood; after the warm environment has been entered the percentage of blood solids is less.

"Water is a great transporter of heat. The extra quantity is now rushed through the body surface, facilitated by widening of the blood vessels of the skin. Thus heat becomes rapidly dissipated. Acting under further instructions from the brain the sweat glands are set into action and pour this water over the body surface and in this way use is made of the cooling power of evaporation. Besides this, other messages are relayed to the muscles of respiration as a result of which water-laden, hence heat-laden, air is pumped out more rapidly through the lungs. Reverse processes are set into play when the body is removed to an environment which is cold."

Besides demonstrating the increased or diminished transport of water by the blood, according as the body is exposed to heat or cold respectively, Prof. Barbour succeeded in showing that this mechanism is under control of the brain especially the "temperature nervous centers". So long as the proper connections between the brain and the rest of the body are maintained a constant temperature is assured. In warm and cold baths animals lacking this connection do not respectively dilute and concentrate the blood, hence there is no proper water-shifting in their bodies and their temperature approaches that of the bath.

(Third Article on Evolution)

THE GEOLOGICAL HISTORY OF MAN

By John C. Merriam,
Formerly Professor of Paleontology and Historical Geology,
University of California.

(From "The Emergence of Man" presented before the National Academy of Sciences)

A most interesting chapter in paleontologic evolution, which is necessarily a preliminary to discussion of early human history, is that covering the successive stages of development of the anthropoids to which man shows closest resemblance. If man is considered to be derived from apes, it is necessary to know whether the assumed ancestor existed before man appeared. It is also in many respects as essential to trace the evolution of these hypothetical ancestors up to the branching off of man, as it is to trace man back toward the type from which he is presumed to be developed.

The primate or man-monkey group was in evidence, clearly defined, considerably differentiated, and widely distributed, in Eocene time, five periods before the present day, or at the beginning of the stage of dominance of the great mammal group. Although the known fossil remains of anthropoids are fragmentary, the available material is sufficient to show distinctly a considerable range of forms in which there are present characters approaching those of the human type, as well as the diagnostic features of the gorilla and the chimpanzee.

Taking the sequence of anthropoid forms as we know it, we find that in the earlier portion of Cenozoic time or age of mammals only relatively simple types are known in which there are foreshadowed characters of both the typical anthropoid and gibbon types. In middle and late Miocene the gibbon becomes distinctly separated from the true apes, and there appears a group of several genera including characters of orangs, chimpanzees, gorillas, and humans. As we proceed through the Cenozoic these groups become sharply defined, until by the end of the Pliocene they are clearly separated as at the present time, and in their development have passed through stages from some one of which the line of evolution to man may well have originated.

We have seen that remains of man-like forms are not limited to deposits of the present period nor are they found in all formations of the geologic succession. We find the earliest evidences indicating the presence of man occurring at that particular time, and not before the time, when evolution of the group of animals most closely resembling us had reached a stage near to the human type.

We find the earliest humans represented as a part of the normal life of the earth in a period so remote that in our calculation of its date a thousand years seems only as a day. The earliest creatures referred to the human group were long dead, and had become ashes of a bygone age, before the world saw the beginning of many extended series of events which charged the form of continents, shifted the earth climate back and forth from arctic to temperate in charges of the Glacial Epoch, and passed over the earth long processions of living generations each in turn enjoying its hour of geologic time and fading out into the night of history. Although of these most ancient humans the earliest preserved traces are very faint, we find them adequate to show that at the time in which they lived our race was represented by beings set off from other primates by their erect bodies, long-striding limbs, hands that were free to build, and a brain that began to plan. And yet we find these forms more beast-like and more anthropoid than any type of man at any later time.

So far as our evidence goes, it meets the requirements of those who assume the emergence of man from the animal world in the same manner in which innumerable other organic types have arisen in the long life record as we know it.

The reading of the full story of the advent of man is still to come, and the task of deciphering it will go on into coming centuries. With this must proceed also interpretation of the subsequent stages of man's growth or evolution.

If we pass in review the stages in evolution of man, it is desirable to note the evidence of geological succession of four human types, and with this to state that all four were present on the earth before the beginning of the present period. The proof of their antiquity seems especially striking when we consider that between the time of appearance of the third or Neanderthal type and the present day events

of great geological and biological significance profoundly changed the face of Nature and that after the Neanderthals had become established a period of fifty thousand to two hundred thousand years probably elapsed before the modern races became dominant.

It should be noted again that remains of the later stages, including Neanderthal, although apparently absent from the New World seem widely distributed over Europe, Asia, and Africa. The first two stages, represented by Pithecanthropus and Heidelberg man, are known by single occurrences, and the one generally assumed to be the earlier is situated in a region known to be an area of evolution of the anthropoid group.

We have also seen that the series shows us, in passing backward through it, a reduction in brain capacity, increase in prominence of the face, and general taking on of anthropoid characters, until the earliest form is recognized as unquestionably of all human types the one standing nearest to the apes, and yet apparently distinguished from anthropoids by its specialized human limbs.

While the evidence is incomplete, the record as it stands agrees down to extraordinary detail with the expectation which one might have of early human history based upon the view that man, while a derivative of the anthropoid group, is now widely separated from all simian types, and has presumably required long ages in which to reach his present stage of differentiation away from the primitive stock.

The earliest occurrences are at the geographic point where we would expect to find them. The earliest types represent approximately the stages of evolution that the paleontologist would anticipate discovering in the strata in which they have been recovered. The later history shows a gradual modification at a rate corresponding in general to that seen in history of other groups of mammals. We note also that the family seems to spread itself gradually over the world, and as nearly as we can determine, with this wider distribution there begins the differentiation into distinct types or species characteristic of geographic provinces.

In a word, human history, so far as the development of physical or biological man is concerned, indicates that our origin is comparable to that of other organic groups, and that we are apparently an outgrowth from the mammal world subject to the same laws of evolution and differentiation as are expressed in myriads of other organic types. The existing races of man represent the morphological and geographical expression of this evolutionary history. Their characters are clearly the result of hundreds of thousands of years of differentiation. The stamp that is put upon each type is the product of extraordinarily complicated influences in which inheritance and environment are essential elements. They are not fleeting impressions, but have significance comparable to that definiteness in organic type which leads us to expect the rose to beget roses, and lions to be the offspring of lions.

Students of biological aspects of the human problem have recently called particular attention to the importance of race as weighing definitely in consideration of many world problems, along with the factors based upon differentiation of peoples according to linguistic stocks, ethnologic relationships, and social organization. This is not interpreted to mean that great significance does not attach to the group influence in peoples organized according to ethnologic characters, or by reason of the ffect of language, or through many other causes. It does mean that factors of fundamental significance, resting upon basal characteristics of human nature, brought out in our long history, and represented now in race, have perhaps received less consideration than is their due. It means not only that a clear view of the human situation must present a picture showing the common generalized characters represented in practically all human types and individuals, but that with these we must see also the length and breadth, the height and depth of human differences. Unless this view is taken we shall fall short of the interpretation of humanity needed in order to give to every group, as well as to every individual, that full freedom to develop <u>its own peculiar talent</u>, and to grow into the fullest usefulness which we assume to be the natural right of all.

And finally, the whole trend of history within the chapter just read from ancient records exhibits without question a definite progressive movement of the human type. This is expressed in physical capacity for greater breadth of comprehension, and wider range of activity and occupation given by coordination of the brain and hand as also of the brain and tongue. Man of the present day may read his story back to that early stage in which he first sees himself distinguished from the beast. He sees the

beast made to a man-like beast and then a man. Perhaps to you the student of this ancient life has seemed to look upon a passing scene which might well have been left unknown - and yet to those who read what he who runs may see, the present world is brighter for the view - the future built upon the upward striving of the past must see the best there is in life at length prevail.

FIRST COLLEGE COURSE ON
INTERPRETING SCIENCE

New York. - The first course teaching how to interpret science will be held in the coming summer session of Teachers College of Columbia University. Its aim will be to present in non-technical language the results of recent scientific research. Sixteen different lecturers will cooperate in giving this course; each in turn explaining certain discoveries and inventions and their influence upon modern life.

Professor Otis W. Caldwell of the Lincoln School, who directs the course, will present some typical science biographies. Questions of public health will be discussed by Dr. Simon Flexner of the Rockefeller Institute, Dr. George E. Vincent and others. The new developments in telegraphy and telephony by wire and radio will be explained and illustrated by the engineering department of the Western Electric Company. Dr. Edwin E. Slosson of Science Service will show what changes have been made in public affairs and private life by the introduction of photography, gasoline, sugar, coal-tar products and refrigeration. Among the other lectures are "Vitamines" by Dr. Walter H. Eddy; "The World's Food Supply" by Dr. John M. Coulter; "Geography and Men" by President W. W. Atwood of Clark University; "The Warfare Against Insects by Dr. L. O. Howard of the Department of Agriculture, and "A Modern Botanic Garden" by Dr. George T. Moore.

This course will impress teachers with the desirability and the possibility of reaching a wider public with a knowledge of scientific methods and achievements.

SHEFFIELD
IS INDIGNANT

Sheffield, England. - The Corporation of Sheffield, England, is too old fashioned and conservative. In choosing the wedding gift of Sheffield cutlery for the Princess Mary, the corporation chose the time honored carbon steel upon which the fame of Sheffield was based. This selection has raised a storm of protest from those who maintain that stainless steel would more fittingly have represented Sheffield's sentiments to the recipients, and at the same time expressed in an official manner the city's confidence in this its latest product to win world wide fame. The great demand for stainless steel has prevented the industrial slump from seriously crippling the cutlery industry of Sheffield.

DO YOU KNOW THAT -

About fifty out of every hundred natives examined in two villages near Lake Maracaibo, Venezuela, showed infection from malaria.

An Australian investigator reports that perfectly ripe, dry grain can be stored without injury in an atmosphere of nitrogen or carbon dioxide while the eggs of weevil and other beetles cannot develop.

It has been proved that the earth as a whole enjoys a somewhat warmer climate when sun-spots are scarce than when they are numerous. The difference of temperature is most pronounced within the tropics, but is nowhere large enough to be of much practical importance.

Norway is investigating the possibilities for electrifying its railways.

DO YOU KNOW THAT -

Steam was first applied to industrial purposes about 1750.

The typical germ cell is a microscopic globular body consisting of cell substance called cytoplasm, in the midst of which is embedded a mass called the nucleus.

The wastage of natural gas in the United States is about half the total production. It is estimated that $36,000,000 worth of natural gas could be saved annually by proper adjustment of cooking appliances alone.

With an increase in population of Manchuria of almost 100 per cent since 1910, the number of plague deaths in 1920-21 was only 8500 as compared with 50,000 recorded in the 1910-11 epidemic.

DO YOU KNOW THAT -

A full-sized airplane wing suspended below an airplane in high speed flight will shortly be tested at the Langley Field Laboratory of the National Advisory Committee for Aeronautics. This will be the first time that a real wing has been tested in actual flight.

A full chart of the ancestry of all the two hundred millions, more or less, of people of English ancestry scattered over the world would, if carried back to the twelfth century and written with one name to the square inch, cover some twenty-five millions of square miles.

Mixed or impure stock, under modern methods of harvesting and handling the pea crop for canning may result in the introduction of undesirable seed which may ruin the entire output of a canning factory.

Some grape growers make two applications of nitrogen to their vineyards, the first at plowing time, and the second near the blossoming period.

DO YOU KNOW THAT -

While it is expected that the modern office building will have a life of over a hundred years, it is probable that most of the modern structures of today will fail to suit the practical requirements of their locality a century from now.

The forests of the United States comprise 465 million acres, of which 191 million acres are owned by farmers in the form of farm wood lots.

One reason for damp cellars in the summer is that the moist air in contact with the cool inner surface of the walls and floor is chilled below its dew-point and condensation results.

Accounts of rains of fishes, according to Dr. E. W. Gudger, are not necessarily "fish stories". He says such falls of fishes from the sky may be caused by high winds, whirlwinds and water-spouts that draw up the fishes from the water and scatter them as their force is spent.

DO YOU KNOW THAT -

Undesirable flavors may be removed from barrels by the use of solutions of caustic soda or potash.

Grape leaves make a good covering for dill pickles, and cabbage leaves for sauerkraut.

"Linguë" is a native Chilean wood used in the manufacture of shoe heels. Brazilian cherry is also used for this purpose.

The cellar, if planned as compactly as the upper floors of a house, contains a waste of about three-fourths of its cubage.

DO YOU KNOW THAT -

Four varieties of tomatoes have been developed which will produce heavy crops of excellent fruit on land so badly infested by wilt that ordinary tomatoes can not be grown upon it.

The fur-seal industry at the Pribilof Islands yields the U. S. Government from $1,000,000 to $2,000,000 annually. In the season of 1921 there were taken 23,671 sealskins from the herd which numbered 581,453 animals.

The milling quality of wheat can often be improved by moistening. Hard wheats are improved more than soft and dry more than moist. The best moisture content is about 15.5%.

The Chinese make out of the soy bean a substance strongly resembling milk in color, taste and chemical composition.

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THE GEOLOGICAL HISTORY OF MAN, page 9. Beginnings of Human History Read from the Geologic Record and the Emergence of Man, by John C. Merriam, (In Scientific Monthly, September 1919, April 1920 and May 1920.) Earth Sciences as the Background of History, by John C. Merriam, (In Bulletin of the Geological Society of America, July 1920).

FRAGMENTS OF SCIENCE

The aeroplane is the nearest thing to animate life that man has created. In the air a machine ceases indeed to be a mere piece of mechanism; it becomes animate and is capable not only of primary guidance and control, but actually of expressing a pilot's temperament.

The lungs of the machine, its engines, are again the crux of man's wisdom. Their marvelous reliability and great intricacy are almost as awesome as the human anatomy. When both engines are going well and synchronised to the same speed, the roar of the exhausts develops into one long-sustained rhythmical boom - boom - boom. It is a song of pleasant harmony to the pilot, a duet of contentment that sings of a perfect firing in both engines and says that all is well.- Sir Ross Smith, aviator, who was recently killed on the eve of his around-the-world trip.

To many home owners and prospective builders of homes, the houses overseas have a homelike charm the reason for which is not apparent at first sight. Most of us would admit, however, that these same houses would become commonplace and lacking in interest if they were lifted two, three, or four feet above the ground. Imagine a Warwickshire cottage set up high enough to allow for a well-ventilated cellar, for example, and a part of the reason for the beauty of the English village street is explained.- J. T. Tubby, architect.

Climate, in its briefest possible definition, is average weather, and climate gain their distinctive characteristics through their weather types. No vivid and accurate picture of any climate can be gained merely from a statistical tabulation of the ordinary climatic elements, however complete such a tabulation may be. It is necessary, in addition, to have clear and interesting descriptions of the various weather types. The addition of such descriptions has resulted in a distinct gain in the more thorough understanding of climates, especially in their relations to man.- Prof. Robert DeC. Ward of Harvard University.