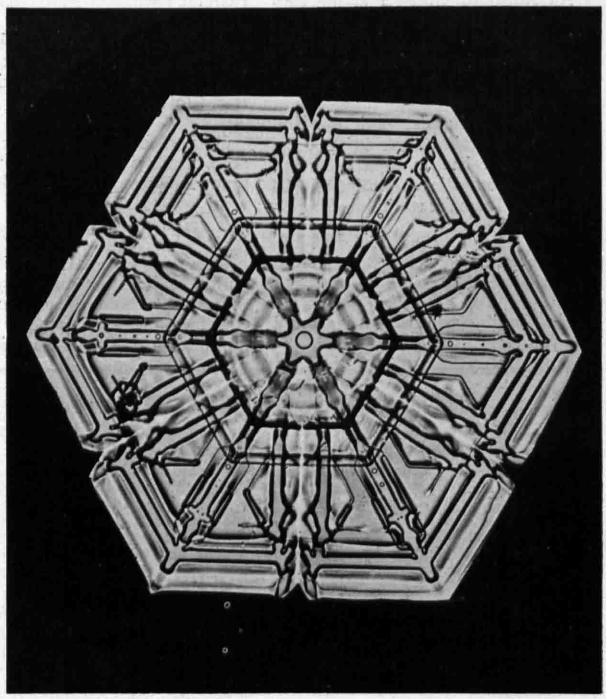
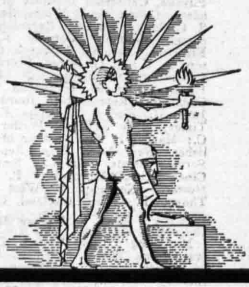
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





FEBRUARY 6, 1932

Myriads of Sisters, But no Twin

See Page 90

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXI *No. 565*

The Weekly Summary of Current Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—$5.00 a year postpaid; two years, $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of $3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md. Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. Patent Office.

? DO YOU KNOW THAT ?

Pulverized coal is transported through pipe lines in the Ruhr District of Germany at a speed as great as 90 miles an hour.

A Museum of Crime has been opened in Rome.

The half moon is only one-ninth as bright as the full moon.

The tip of the hour hand of a man's watch travels about eight inches a day.

An American professor at the University of Nanking, China, says that in the past 2,200 years there have been 2,000 famines in north and east central China.

The first Afrikander cattle ever imported to the United States arrived from South Africa late in December, and after two months in quarantine will be shipped to Texas for use in breeding experiments.

There are now 900,000 hospital beds in the United States.

The world's production of silk thread in a year amounts to 48,000 tons.

Unripe apples were recently exposed to a 1,500 watt electric lamp for five days, and scientists watched the development of the red color on the fruit.

A huge luxury apartment for hens is being built near Milwaukee, where 60,000 hens will lay eggs with benefits of the most up-to-date surroundings.

The word "tuxedo" traces its origin to the name of an Algonquin Indian subtribe: a town was named for the tribe, and the dinner jacket got its name from the town.

A comparison of the smoke in the air of London and New York has been made, and London smoke particles were found to be smaller in size.

Because the present winter in some northern states has been mild, with little snow, snowshoe rabbits that changed to white winter coats have been easy targets for hunters.

Thousands of male mosquitoes were burned to death last summer when they mistook the hum of electric furnace equipment in a laboratory for the alluring song of the female mosquito.

WITH THE SCIENCES THIS WEEK

CHEMISTRY

Latest-Found Elements Named After Virginia and Alabama

Discoverer of Chemistry's Final Building Blocks Would Honor His Native State and State of Adoption

HAIL VIRGINIUM, chemical element 87; hail alabamine, chemical element 85—last of the earth's fundamental building blocks to be christened.

For Prof. Fred Allison, Alabama Polytechnic Institute physicist, has named the last of the unknown elements after his native state of Virginia and after the state of his adoption, Alabama. In communications to the forthcoming journal of the American Chemical Society he will suggest the name virginium and the symbol Va for element 87, and the name alabamine and the symbol Am for element 85. Prof. Allison's discovery of virginium was announced in 1930, and his finding of alabamine last May.

Six Isotopes

One communication will also announce research results that led him and his colleagues, Prof. Edna R. Bishop, Anna L. Sommer and J. H. Christensen, to conclude that virginium has six isotopes, that is, there are virginium atoms of six different atomic weights. Prof. Allison finds considerable differences in their weights and he suggests that they may be transition products in a radioactive transformation. Thus virginium may be closely related to radium and uranium.

Prof. Allison was born on the Fourth of July, 1882, at Glade Spring, Va. He received his training in science and his Ph.D. at the University of Virginia.

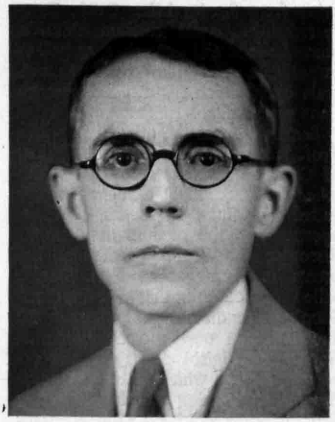
In the research of 1930 that led to the detection of element 87 he had the assistance of Edgar J. Murphy, now at New York University.

The finding of element 85, the last of the missing elements, completes the filling of the table of 92 chemical elements as predicted by Mendeleeff, the Russian chemist who discovered their periodic relationship. Thus Prof. Allison is claimant to the honor of revealing the two most recently discovered chemical elements and the last two which chemists have been able to predict. The only other discovered-in-America element was illinium, detected by Prof. B. S. Hopkins of the University of Illinois in 1926.

New experiments, to be described in the chemical journal with the second announcement concerning element 85, confirm its discovery. In these researches only one four-hundred-thousandth of a gram of alabamine compound was prepared, but this small quantity was more than enough to satisfy the tests. One hundred pounds of the mineral monazite sand, the source of the cerium and thorium in gas mantles, was used in the work. Prof. Allison checked the discovery by comparing his analysis of the new element with analyses of its closest chemical relations, chlorine, bromine and iodine. From his research he estimated an atomic weight of 221 for alabamine, which places the new element in its proper place just below the rare gas, niton, in the table.

In his researches upon both elements 87 and 85, Prof. Allison and his colleagues used a novel magneto-optic method of analysis which depends on a phenomenon discovered about a century ago by Michael Faraday, father of the electrical industry and one of the great scientists in history. Faraday found that a magnetized liquid rotates a beam of polarized light passed through it. Prof. Allison found that about a billionth of a second elapses after switching on the magnetizing current before the influence on the light vibrations is observed in the liquid. This lag is different for various substances and allows their detection.

In the latest report, Prof. Allison tells of detecting virginium in sea water,



PROF. FRED ALLISON

The physicist of Alabama Polytechnic Institute who discovered the final elements, Virginium and Alabamine.

MEDICINE

Plenty of Water Found Better Than Little for Nephritis

A COMPLETE reversal in the treatment of nephritis is announced by Dr. L. H. Newburgh and Dr. F. H. Lashmet of the University of Michigan Department of Internal Medicine. The treatment has already been adopted at the University Hospital.

In the present treatment of nephritis the amount of water and other fluids taken by the patient is strictly limited to a maximum of about two and one-half quarts in twenty-four hours. This is based on the theory that the diseased kidney cannot remove much waste and therefore should not be taxed with large amounts of water for filtration.

The Michigan investigators, however, find that in nephritis the diseased kidney can eliminate as much waste as the healthy organ if it is supplied with more instead of less than the normal amount of water. They have developed the exact mathematical relationship between the amount of water demanded by the kidney to eliminate a given amount of waste in a given time. They state that 2,800 cubic centimeters, or about three quarts, is the absolute minimum intake for the average nephritic kidney and they have forced the intake of fluids up to as much as seven quarts with great success. Their report was announced to the Washington County Medical Society.

brine from Searles Lake, Calif., Stassfurt kainite, crude caesium chloride, monazite sand and samarskite, as well as in pollucite and lepidolite, the two minerals upon which his original observations were made.

Samarskite was the mineral in which Prof. Jacob Papish and Eugene Walner of Cornell University reported last October the detection of element 87, now called virginium, by means of X-ray spectroscopy, the method used in the discovery of other missing chemical elements in recent years. Prof. Papish called in question at that time Prof. Allison's prior discovery of element 87. Prof. Allison now presents confirmation of his original claims and new experimental data which he believes justifies him in naming the element. Since Prof. Papish's attack on Prof. Allison's results, the magneto-optic method of analysis has been used by Prof. J. L. McGhee and Margaret Lawrenz at Emory University, Atlanta, Ga., and Prof. Allison's claims thus verified.

Prof. Allison finds that the magneto-optic method will detect extremely minute quantities of concentrations of a substance, as low as one part in a trillion. The concentration of virginium in all substances examined by Prof. Allison is very low, ranging from a few parts in a trillion to one part in ten billion.

It is predicted that the magneto-optic method of chemical analysis will become a new and useful tool for science.

Virginium replaces the temporary name eka-caesium, meaning the element below caesium in the periodic table, that was given element 87 by Mendeleeff. Element 85, now called alabamine, was known as eka-iodine.

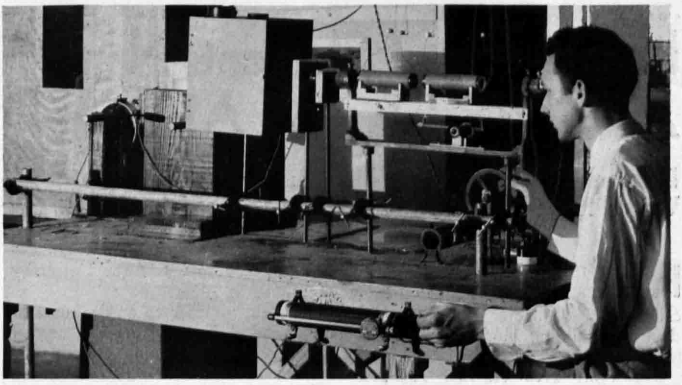
Science News Letter, February 6, 1932

PHYSIOLOGY

Maya Indians Have Better Teeth than College Girls

INDIANS have better teeth than college girls, it appears from a report of Dr. Morris Steggerda of the Carnegie Institution of Washington to *Eugenical News*. Dr. Steggerda examined the teeth of Indians in Yucatan, descendants of the famous Maya Indians. Of 42 individuals between 15 and 24 years, 62 per cent. had all of their teeth in perfect condition, he found. Of 24 individuals from 25 to 34 years, 43 per cent. had perfect teeth. On the other hand, of 100 Smith College students between the ages of 17 and 24 years, there was only one who had perfect teeth.

Science News Letter, February 6, 1932



ONE PART IN A TRILLION

This is the magneto-optic apparatus used in the detection of the last unknown elements, 85 and 87. Samples of the substance suspected to contain the elements are placed inside the electric coils. A beam of light then tells the story to the observing scientist. The apparatus will detect one part of a substance in a trillion.

ENGINEERING

Scientists Work to Freshen Stale Air with Electricity

CONCLUSIVE evidence that minute electrified particles of the air, known to scientists as ions, are the real cause of fresh, invigorating atmosphere is being sought at the Harvard School of Public Health in Boston by Prof. C. P. Yaglou, assisted by L. Claribel Benjamin and Sarah P. Choate, technicians. These workers reported results of their research before the annual meeting of the American Society of Heating and Ventilating Engineers.

The studies consisted chiefly in measuring the number of ions in different kinds of atmosphere. They indicate that atmosphere which is considered "deadening" to the breather is likely to contain only a small number of ions per unit of volume.

Prof. Yaglou told Science Service that at the present stage of the research he would not be justified in saying that "dead" air can be made fresh and invigorating simply by increasing the ionic content with an electric apparatus. "The consensus of opinion among our experimental subjects," he continued, "seems to indicate that highly ionized air is fresher than air of low ionic content, but the number of observations is too limited to draw definite conclusions at this time."

Prof. Yaglou and his assistants found that the common rate of ventilating buildings is entirely insufficient to maintain the normal ionic content of the air in a crowded room, the necessary rate of 160 cubic feet per person per minute being prohibitively high. But with electric apparatus they were able to keep the ionic content of air in a crowded room at a high figure when outdoor air was entering at the usual rate of ventilation of thirty cubic feet per person per minute.

"In contrast with the prevailing belief," they stated, "the ionic content in unoccupied heated rooms did not differ much from that out of doors, and in cold weather it was often higher, owing probably to a temperature effect."

The concentration of ions in the air changes both seasonally and daily, it was pointed out. There were said to be more ions in the air during the summer than in winter, on clear days than on rainy, foggy or gray days, and as a general rule the concentration is higher during the day than at night.

"In nature, ions are produced by solar radiation, by cosmic rays, and by radioactive changes in the soil of the earth," the report explained.

Science News Letter, February 6, 1932

ARCHAEOLOGY

Exact Reproduction Not Goal Of Ancient Greek Sculptors

Scientist Finds Portrait Worker of "Golden Age" Attempted to Reveal Only Essential Character of Subject

WHEN you walk through an art gallery and look up at the marble statues of Miltiades, Pericles, and other famous Greeks, you are not always seeing the features of the great men as they appeared in life. In fact, if a citizen of ancient Athens were to join you in the tour of the gallery, he probably could not identify very many of his national heroes from the sculptors' portraits.

Greek artists did not ordinarily try to reproduce the exact features of human beings before the fourth century B. C. when the Golden Age of Greece was at its height, declares Dr. Elmer G. Suhr, who has been conducting research at the Johns Hopkins University on the "Sculptured Portraits of Greek Statesmen." Dr. Suhr has just published his results in a volume issued by the Johns Hopkins Press.

The main reason why the sculptors of Greece did not turn their skill to preserving the features of great men is traced to their religion. Sculptors gave their best efforts to statues of Apollo, Athena, and other deities. They tried to make the figures as beautifully perfect as the gods were thought to be.

For centuries, the Greek sculptor was bound by the tradition that a human being's statue could not stand on a level with that of a god. And when the sculptor Phidias, who lived in the fifth century, dared to place his own features on the shield of Athena, he brought disgrace upon himself.

One of the first statesmen of Greece to have his likeness preserved was the hero of the battle of Marathon, Miltiades. But his fifth century portrait scarcely deserves the name according to modern standards of portraiture. Sculptors of Miltiades' day had no models to pose for them. They were accustomed to work from memory. They aimed to portray the character or essence of the subject, rather than to show the exact size of the nose or the expression of the mouth.

Dr. Suhr points out that the modern sculptor Auguste Rodin followed a similar method when he made a portrait of the French novelist Balzac. Rodin had never seen Balzac, yet many critics pronounce Rodin's statue an excellent portrayal of what Balzac stands for as a man and an author.

It was in the fourth century that Greek portrait art took a new turn, Prof. Suhr states. There was talk of anatomy and of physical proportions in art circles, so much so that living models began to be used when statues of the gods were made. The beautiful maiden Phryne, assistant to Praxiteles, was one of the first.

Science News Letter, February 6, 1932

ENGINEERING

Sunspots and Tree Rings Prove Aid to Engineer

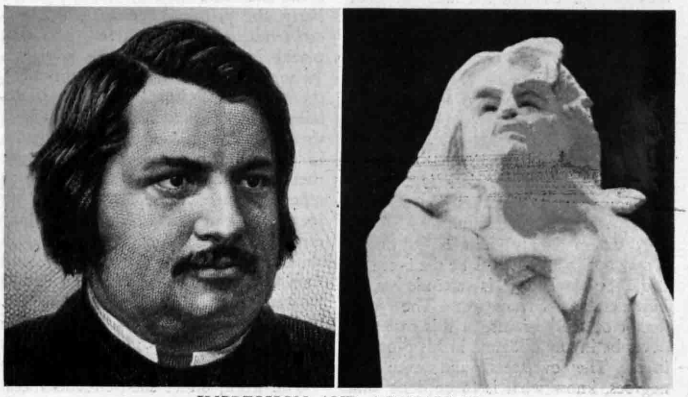
THAT CONSTRUCTION may embrace more than orthodox engineering is shown in the case of the proposed hydro-electric plant on the upper Salt River in Arizona, where data have been obtained from the study of the growth of trees, the behavior of the sun, and the formation of lake bottoms.

Weather records for a sufficiently long period were not available for the accurate estimation of rainfall in future years, John Girand, hydraulic engineer of Phoenix, Ariz., states. Consequently, investments in works for irrigation or power would be necessarily hazardous. Botany, astronomy and geology were called into service, however, and proved themselves worthwhile assistants.

Tree rings, it is well known, are a good index to the extent of annual rainfall in past years. While the rainfall records for the Arizona region under consideration covered only thirty years, the rings of certain tree trunks in the area provided a continuous record for the past 269 years. Reference to the tree "chart" enabled the engineer, so Mr. Girand will say in the forthcoming issue of the magazine *Civil Engineering*, to determine whether his thirty-year record embraced a wet, dry, or normal period, and whether it was a fair basis for analysis of the flow of the river. From the relation of the river flow to the tree rings it was possible, Mr. Girand said, to predict the flow of the future.

Tree rings are not the only factors related to rainfall. On the bottoms of pools and lakes formed by glacial damming are layers of clay called varves, which have been deposited over many years. And just as the wider tree ring indicates more rainfall, so the thicker clay layer does likewise. Bound up indisputably with these clay layers and tree rings, says Mr. Girand, are the familiar spots on the sun. It has been found that the greatest sunspot activity parallels scanty rainfall.

Science News Letter, February 6, 1932



IMPRESSION AND ACTUALITY

At right is a piece of sculpture done in modern times after the manner of the old Greek artists, who sought to portray character. It is a statue of Balzac, by the great sculptor, Rodin. Left shows the engraver's life-like representation of the French author. Contrast it with Rodin's impression of Balzac's character.

AGRICULTURE

George Washington, Experimental Farmer

"A Classic of Science"

A Five-Year Plan for Rotation of Crops on His Farms, With Some Good Advice on the Conduct of Any Business

From the original letters, preserved in the Library of Congress.

George Washington, when he wrote this letter to accompany some thirty manuscript pages of detailed instruction for planting every field on his four farms, was looking forward to settling down at last to the life which he loved, that of a practical farmer. Less than a week later he was dead, a victim, ironically, of the indomitable energy so evident in these directions.

TO JAMES ANDERSON, Manager of the Farms.

Mount Vernon,
10 December, 1799.

Mr. Anderson:

From the various plans suggested by you at different times for cropping the farms, which I propose to retain in my own hands, in the year 1800, and with a reduced force of the laborers on them, in succeeding years, together with the operations necessary to carry them into effect; and comparing these with the best reflections I have been able to bestow on the subject; and considering, moreover, the exhausted state of my arable fields, and how important it is to adopt some system by which the evil may be arrested, and the fields in some measure restored by a rotation of crops, which will not press hard upon, while sufficient interval between them is allowed for improvement; I have digested the following instructions for my manager (while it is necessary for me to employ one) and for the government of my overseers, and request that they may be most *strictly* and *pointedly* attended to and executed, as far as the measures therein required will admit.

A system closely pursued, (although it may not in all its parts be the best that could be devised), is attended with innumerable advantages. The conductor of the business, in this case, can never be in any dilemma in his proceedings. The overseers, and even the negroes, know what is to be done, and what they are capable of doing, in ordinary seasons. In short, everything would move like *clock work*. The force to be employed may be in due proportion to the work which is to be performed, and a reasonable and tolerably accurate estimate may be made of the produce. But when no plan is fixed, when directions flow from day to day, the business becomes a mere chaos, frequently shifting, and sometimes at a stand, for want of directions what to do, or the manner of doing it. These occasion a waste of time, which is of more importance, than is generally imagined.

Nothing can so effectually obviate the evil, as an established, and regular course of proceeding; made known to all who are actors in it, that all may thereby be enabled to play their parts to advantage.

This would give ease to the principal conductor of the business, it would be more satisfactory to the persons who immediately overlook it, and would be less harassing to those who labour, as well as more beneficial for those who employ them.

Under this view of the subject, and of the change which is about to take place next year, by having rented one of the Farms—the Mill—and Distillery,—and having it in contemplation to do the same with the Fishery at the Ferry, the principal service, which you can render me, (after these events take place) is to explain to the overseers (who will be furnished with duplicates) the plan, in all its parts, which is detailed in the following sheets; to hear their ideas with respect to the order in which the different sorts of work therein pointed out shall succeed each other, for the purpose of carrying it on to the best advantage; to correct any erroneous projects they may be disposed to adopt for the execution thereof; and then to see, that they adhere strictly to whatever may be resolved on, and that they are always (except when otherwise permitted) on their respective farms, and with their people.

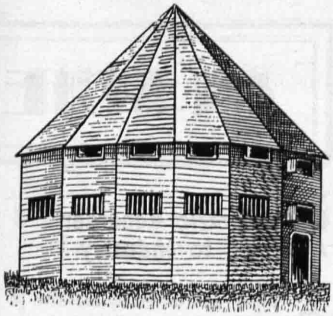
The work, under such circumstances, will go on smoothly; and, that the stock may be well fed, littered, and taken care of according to the directions which are given; it will be necessary to inspect the conduct of the overseers in this particular, and those also whose immediate business it is to attend upon them, with a watchful eye; otherwise, and generally in severe weather, when attention and care is most needed, they will be most neglected.

Economy in all things is as commendable in the manager, as it is beneficial and desirable by the employer; and, on a farm, it shows itself in nothing more evidently, or more essentially, than in not suffering the provender to be wasted, but, on the contrary, in taking care that every atom of it be used to the best advantage; and, likewise, in not suffering the ploughs, harrows and other implements of husbandry, thereon and the gears belonging to them, to be unnecessarily exposed, trodden under foot, carts running over them, and abused in other respects.

More good is derived from looking into the minutiae on a farm, than strikes people at first view; and by examining the farm-yards, fences, and looking into fields to see that nothing is within but what are allowed to be there, produces more good, or at least avoids more evil, oftentimes than riding from one working party or from one overseer to another generally accomplishes.

I have mentioned these things not only because they have occurred to me, and tho' apparently trifles, but because they prove far otherwise in the result.

And it is hoped, and will be expected, that more effectual measures will be pursued to make butter another year; for it is almost beyond belief, that from 101 cows actually reported on a late enumeration of the cattle, that I



EXPERIMENTAL BARN

Always interested in agricultural improvement, Washington built this barn of original design at his Dogue Run Farm.

am obliged to *buy butter* for the use of my family.

To visit my Lands in the Western Country (at my expence) so soon as the weather becomes temperate and settled in the Spring—Reporting the circumstances under which they are—and what they are capable of—will be expected, it being of importance for me to receive a just, and faithful account respecting them.

After perusing the accompanying plans *carefully,* furnish me with your opinion on the two following points.—1st. What quantity of Seeds, and of what kinds, I shall have occasion to *buy* and against what periods, for seeding the Grounds in the year 1800 in the manner therein directed:—and 2d. whether any and what number of hands can be withdrawn from the three Farms I retain in that year; In considering this last mentioned point hear the opinions of the overseer.

The account for the present quarter must be made final, as an entire new scene will take place afterwards. In doing this, advertise in the Alexandria paper for the claims of every kind and nature whatsoever against me, to be brought to you by the 1st of January, that I may wipe them off, and begin on a fresh score. All balances in my favor must either be received, or reduced to specialties, that there may be no disputes hereafter.

I am, yr. sincere friend—well wisher —and Servant,

GEO. WASHINGTON.

In the years 1802, 1803, *and so on.*

The corn ground remaining the same, two fields, in the following numbers, will be fallowed for wheat, and treated in all respects as mentioned above; and if pumpkins, cymlins, turnips, pease, and such like growth, are found beneficial to the land, or useful and profitable to the stock, ground may readily be found for them.

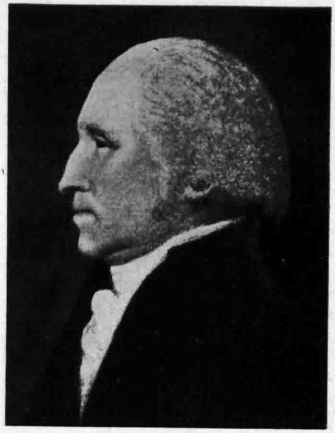
These are the great outlines of a plan, and the operation of it, for the next year, and for years to come, for the *River Farm.* The necessary arrangements and all the preparatory measures for carrying it into effect ought to be adopted without delay, and invariably pursued. Smaller matters may, and undoubtedly will, occur occasionally; but none, it is presumed, that can militate against it materially. To carry it into effect advantageously, it becomes the indispensable duty of him, who is employed to overlook and conduct the operations, to take a prospective and comprehensive view of the whole business, which is laid before him, that the several parts thereof may be so ordered and arranged, as that one sort of work may follow another sort in proper succession, and without loss of labour or of time; for nothing is a greater waste of the latter, and consequently of the former (time producing labour, and labour money), than shifting from one thing to another before it is finished, as if chance or the impulse of the moment, not judgment and foresight, directed the measure. It will be acknowledged that weather and other circumstances may at times interrupt a regular course of proceedings; but, if a plan is well digested beforehand, they cannot interfere long, with a man who is acquainted with the nature of the business, and the crops he is to attend to.

Every attentive and discerning person, who has the whole business of the year laid before him, and is acquainted with the nature of the work, can be at no loss to lay it out to advantage. He will know that there are many things which can be accomplished in winter as well as in summer—Others, that Spring, Summer and Autumn are fit for. In a word, to use the wise man's saying, "That there is a time and a season for all things", and that unless they are embraced, nothing will thrive; or go on smoothly. There are many sorts of *indoors* work, which can be executed in hail, rain, or snow, as well as in sunshine; and if they are set about in fair weather (unless there be a necessity for it), there will be nothing to do in foul weather; the people therefore must be idle. The man of prudence and foresight will always keep these things in view, and order his work acordingly, so as to suffer no waste of time, or idleness. These same observations apply with equal force to frozen ground, and to ground too wet to work in, or which, if worked, will be injured thereby.

These observations might be spun to a greater length, but they are sufficient to produce reflection; and reflection, with industry and proper attention, will produce the end that is to be wished.

There is one thing, however, I cannot forbear to add, and in strong terms; it is, that whenever I order a thing to be done, it must be done, or a reason given at the time, or as soon as the impracticability is discovered, why it cannot be done, which will produce a countermand or change. But it is not for the person receiving the order to suspend, or dispense with, its execution; and, after it has been supposed to have gone into effect, for me to be told that nothing has been done in it, that it *will* be done, or that it could not be done; either of these is unpleasant and disagreeable to me, having been accustomed all my life to more regularity and punctuality. And know that nothing but system and method are required to accomplish any reasonable requests.

Science News Letter, February 6, 1932



WASHINGTON

Did not "flounce" for this his last portrait, painted by his physician, Dr. Elisha Dick. Concerning portraits, Washington wrote: "In for a penny, in for a pound," is an old adage. I am so hackneyed to the touches of the painter's pencil, that I am now altogether at their beck; and sit, "like Patience on a monument," whilst they are delineating the lines of my face. It is a proof, among many others, of what habit and custom can accomplish. At first I was as impatient at the request, and as restive under the operation, as a colt is under the saddle. The next time I submitted very reluctantly, but with less flouncing. Now, no dray-horse moves more readily to his thill than I to the painter's chair.—From a letter to Francis Hopkins, dated 1785.

ENGINEERING

New Insulator Used In Submarine Telephone Cable

THE WORLD'S longest telephone submarine cable, which went into operation this month between Key West and Havana, Cuba, was made possible by the development of a new insulating material, it was explained to the American Institute of Electrical Engineers at New York by H. A. Affel of the American Telephone and Telegraph Co. and W. S. Gorton and R. W. Chesnut of the Bell Telephone Laboratories.

The new material is composed of deproteinized rubber, deresinated balata and wax. It replaces gutta percha, which has been used in deep sea cables in the past. If this cable were insulated with gutta percha of the kind used in the last Key West-Havana cables laid in 1921, it would weigh 45 per cent. more and its cost would be 65 per cent. higher, the engineers stated.

The new cable is 125 statute or 108.6 nautical miles long and lies 6480 feet below the surface at the deepest point. The next longest deep sea telephone cable is that in the Canary Islands which connects Teneriffe with Gran Canaria, 39.7 nautical miles distant.

Carrier operation now provides three channels of communication over the single copper conductor of the new cable. Additional channels may be provided.

Science News Letter, February 6, 1932

ARCHAEOLOGY

Folsom-Type Point Found With Bones of Ice Age

NEW EVIDENCE of the probably great antiquity of man on the American continent has been found in a cave near Carlsbad, N. M. An arrowhead of the "Folsom" type, regarded as very old by most anthropologists, was discovered buried seven feet beneath the floor level, associated with the bones of extinct animals that flourished in the land when all the northern part was buried under pleistocene glacial ice. These animals include two extinct species of horse, musk-oxen, which are now found only in the Arctic, camels, bison, and an extinct four-horned antelope. With these bones were also those of still-existing Mexican deer.

This rich find was made by E. B. Howard of the University of Pennsylvania Museum, and developed by him and Barnum Brown of the American Museum of Natural History. There are still a good many bones of smaller animals awaiting identification, so that the list will probably be considerably extended by the time the technical results are ready for publication.

Most striking, aside from the presence of a man-made stone point, was the burned condition of one of the musk-ox horns, a further indication of human contact with the animals. Indeed, it is difficult to imagine how such a mass of varied bones could have been accumulated in the cave except by human agency. The great bulk of the bones were those of the musk-ox and the extinct horse species.

The stone point that accentuates the sensational nature of this cave discovery is of the type first found associated with the bones of extinct bison at Folsom, N. M., and again last summer beneath the shoulder-blade of an elephant in western Nebraska.

Science News Letter, February 6, 1932

ANTHROPOLOGY

Original Type Indians Survive in Paiute Tribe

TO IMAGINE what the first Indians were like—those long-ago immigrants who journeyed from Siberia into America to start the habitation of a New World—it is only necessary to study the Paiute tribe of the West.

Paiutes have remained among the most primitive of American tribes, declared Dr. Robert H. Lowie, of the University of California, in an address before the Anthropological Society of Washington.

Describing these Indians of the Great Basin, the region of Nevada, Utah, Idaho, and eastern Oregon, Dr. Lowie said: "Paiutes have kept alive certain traits that we have every reason to believe were brought to America by the primeval Indians."

The first American Indians were wandering hunters, he explained. They knew the art of chipping stone to make weapons. Their only domestic animal was the dog. All of these traits were preserved in Paiute life, down to recent years when the government took a hand in their home life and education. Paiutes were small game hunters, depending on jack rabbits, cotton-tails and ground squirrels for food and skins. Even grasshoppers and ants were gathered for food, and wild roots and plants as well. The tribe adjusted itself to its environment and got a living from the land without tilling the soil.

Science News Letter, February 6, 1932

IN SCIEN

PHYSICS

Photoelectric Recorder Available to Industry

A NEW and extremely sensitive recorder that uses light and electricity to measure smoke, heat, light, pressure, noise and thicknesses of thin materials was introduced to the American Institute of Electrical Engineers by its inventor, C. W. LaPierre of the General Electric Company.

Less than a hundred millionth of the electricity used by an ordinary 40-watt electric light will set the new photoelectric recorder in full operation. Errors of a millionth of an inch are detected when this new engineering tool is used to measure dimensions.

Anything that can be indicated by a sensitive instrument can now be continuously recorded by the photoelectric recorder, Mr. LaPierre explained. It is rapid in its response as well as sensitive. An optical system, using a galvanometer mirror, is combined with a photoelectric circuit in the new device.

Science News Letter, February 6, 1932

ENGINEERING

Flood Control Started At Wrong End of Mississippi

ENGINEERS who two centuries ago first attempted to discipline the Mississippi River, should have begun at Cairo, Ill., where the lower Mississippi begins, and not near New Orleans, where the river reaches the Gulf of Mexico, it appears from a statement made by Prof. Floyd Nagler, of the University of Iowa.

If engineers had started at Cairo with their dikes and levees and proceeded downstream, Prof. Nagler said, the folly of trying to exclude the Mississippi from all of the surrounding plain would have been apparent. As it was, he stated, they began at the river's mouth and a full century of argument has been required to demonstrate conclusively that the Father of Waters must have several outlets into the Gulf. The problem has thus been made one of flood protection instead of flood passage.

Science News Letter, February 6, 1932

E FIELDS

PSYCHIATRY

Depression Called Harmful To Nation's Mental Health

THE DEPRESSION is causing mental maladjustments, of greater or less degree among all sorts of people, though in what number it is impossible to estimate, the National Committee for Mental Hygiene will conclude in a forthcoming bulletin summarizing the mental consequences of unemployment.

Studies now in progress will give definite knowledge of the effects of the present economic situation which now can only be surmised. Inquiries that have been made by mental hygiene agencies do not reveal a general rise in hospital admissions that can be readily interpreted in terms of the depression and there is perhaps little ground for pessimistic or alarming apprehensions in this connection.

There is a feeling, the mental hygiene authorities find, that the effects of the depression will not be apparent for some time to come, not until certain factors that enter into the precipitation of mental disorders have had time to operate. This is in accord with the understanding of modern psychiatry that mental diseases do not occur suddenly but develop gradually over shorter or longer periods of time. Undoubtedly, the experts conclude, there will be some increase in hospital types of mental disorder traceable to the depression.

Science News Letter, February 6, 1932

PUBLIC HEALTH

Lungs of Yale Students X-Rayed for First Time

FOR the first time in the educational history of this country, a policy of X-raying the lungs of all members of the entering classes in all departments of a university has been adopted. This measure was put into practice by Yale University as a further means of safeguarding the health of its students, the annual report of the Department of University Health states.

The X-ray films are made with a view to determining the presence of tuberculosis in any of its manifestations. All students whose chest pictures show indications of trouble are to be carefully followed during their college courses and X-ray pictures of their chests will be made at least once a year.

"A certain number of them should be saved from a breakdown, and a single one so saved would justify the expense," the report stated.

Stereoscopic X-ray films were made last year of 1,602 new students. A total of 283 students, or 17.7 per cent. of those examined, gave evidence of an amount of infection potentially dangerous but, in most cases not destined to cause trouble.

Science News Letter, February 6, 1932

ASTRONOMY

Total Eclipse to Aid Study of Radio Roof

THE TOTAL eclipse of the sun next August 31 will be used by scientists at Ottawa to study the transmission of radio signals through the upper atmosphere, the National Research Council of Canada has announced.

The layer of the atmosphere, varying from 50 to 500 miles high, which reflects radio waves back to earth, is formed by the action of certain of the sun's rays on the upper air. During the eclipse the moon will interrupt the sun's rays and thus scientists will have a chance to study the destruction and creation of this Kennelly-Heaviside layer, an opportunity that will not recur in Canada until the next total eclipse on July 9, 1945.

The National Research Laboratories at Ottawa, the University of Toronto, and McGill University, Montreal, are cooperating in this program which will measure, particularly, the height of the layer immediately before, during and after the eclipse. This will be done by noting the difference between the times of arrival of a radio signal travelling over the surface of the earth and up to the Kennelly-Heaviside layer and back.

Among numerous parties to be in the path of the total eclipse, is one from the University of Cambridge, England, which will make spectroscopic observations on the color of the light from the obscured sun. The British scientists will observe from the Physics Building of McGill University, and from Magog, Quebec, which is in the center of the eclipse path.

The area of total eclipse will form a band about a hundred miles wide with its western edge passing a few miles west of Montreal.

Science News Letter, February 6, 1932

INVENTION

German Invents Rubber Filled With Minute Pores

A NEW FORM of rubber, full of minute pores invisible to the most powerful microscope, is about to come into commercial use in Berlin for storage battery separators, bearing oilers, surgical sponges, surfacings for metal and other purposes.

This microporous rubber was invented by Prof. H. Beckmann of the Hannover Technical University. Only the light yellow color of its surface shows that it has over six billion pores to each square inch of surface, each with a diameter of the order of one two-hundred-fifty-thousandth of an inch. Made from coagulated and vulcanized rubber latex, it is distinguished from ordinary rubber only by its having countless numbers of fine pores.

Its porosity allows it to suck up 60 per cent. of its volume of water. This absorptive power disappears when microporous rubber is subjected to great pressure. Under this pressure it becomes transparent and assumes the light brown color of ordinary rubber.

Science News Letter, February 6, 1932

PHYSICS

Millikan to Study Cosmic Rays at Great Heights

BALLOONS bearing automatic recording instruments, floating free to heights hitherto unattained in such studies, are planned for the further investigation of cosmic radiation by Dr. Robert Andrews Millikan of the California Institute of Technology, American research leader in this field. The launching place for these unmanned explorers of upper air has not been announced, except that it will be in a different latitude from that used for similar experiments in 1922, when Dr. Millikan and his colleague, Dr. I. S. Bowen, sent up recording balloons from Kelly Field, Texas.

In these tests ten years ago, one of the balloons reached a height of 15.5 kilometers, or 9.6 miles. Dr. Millikan hopes to send this year's balloons to greater heights, carrying their featherweight equipment of recording electroscopes, barographs and thermometers into regions where the blanket of air is far less dense and correspondingly more penetrable to the cosmic rays.

Science News Letter, February 6, 1932

METEOROLOGY

Every Snowflake a Unique Jewel

In Over Forty Years of Photographing "the Faery Daughters Of King Boreas", Wilson Bentley Never Found Two Alike

By FRANK THONE

UP IN THE mountains of Vermont, where the winters are long and the snow falls frequently, there died a few weeks ago, a quiet, retiring man who was the world's foremost snow artist. His name was Wilson Bentley. He was not one of the numerous tribe of Michelangelos of melting marble, whose snow sculptures get into the newsreels and rotogravure sections. His was a far more difficult art, for it dealt with single flakes rather than great lumps of matted snow; yet though it dealt with single flakes it was a more permanent art than the efforts of these gravers of the earth's most impermanent plastic.

For Wilson Bentley made photographs of snowflakes: he was Portraiteur to Their Highnesses, the faery daughters of Old King Boreas. For more than forty years, he let the winds of the world bring beauty to his humble doorstep on a small farm near the village called Jericho; he captured it in its most fragile form and held it for a moment while the chilled kiss of the cloud-hidden sun has graven its lineaments in the invisible silver grains of photographic plates. For forty years he accumulated his portraits of princesses in frosty filigree, treasuring them as a less wise man might treasure the jewels they resemble or fine silver pieces whose smiths might learn lessons from their incredibly exquisite patterns. For at least a part of the forty years he had recognition from a few: scientists who would read the riddles of the weather, artists who love beauty and will follow her even to Jericho. But the world heeded him not, nor knew his work.

So far as that goes, even his friends of the outside world who sought him in his home in the hills, and once or twice coaxed him out for a few days of discomfort in the big cities—even his friends "from outside" knew very little about him. He was not a scientist in a great laboratory, for all his magic with the microscope and his cunning with the camera. Nobody knew what he did for a living. He said he was a poor man, and it is true he lived most unobtrusively and plainly, as it is still possible to do in a New England village community without losing caste. But so also have some of the world's richest lived: men like John Borroughs, and his own fellow New Englander, Thoreau, and the barefooted little man, centuries ago, whom his neighbors called "Il Poverello" when they came in admiring crowds to hear him talk.

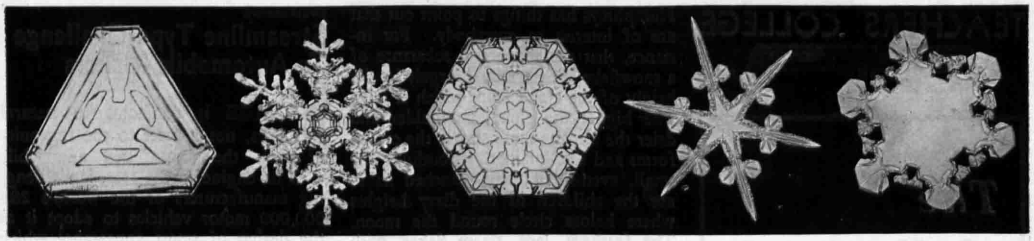
A Hoard of Beauty

His friends of the outside world for years felt considerable concern over the fate of his great collection of plates and photographs. Hundreds upon hundreds they piled up in his little house, a hoard of beauty almost lost to the world. They felt like overprivileged guests, when they were allowed to see with only a few pairs of appreciative eyes what they knew thousands would be glad to behold. Some of them cast about in their minds for ways and means.

To Prof. W. J. Humphreys, physicist of the U. S. Weather Bureau, it seemed that the medium at once the happiest and most practicable would be a book, collecting all of these pictures into a series of fine photographic plates. This would permit the world at large to see in its own houses the treasures that had hitherto been visible only at the cost of a pilgrimage to Jericho, and it would at the same time place this treasury of loveliness safely beyond the irreparable loss that a single fire or other disaster might have caused had it visited Mr. Bentley's home and destroyed his collection of plates and prints.

But such an undertaking would be expensive. There would be no profit in such a book, for it would have to sell at a rather high price to a comparatively limited number of people. A fund would have to be provided to defray a lot of preliminary expenses. A generous donor came forward with the fund, and the American Meteorological Society became its trustees, sponsoring the book. Hours and days of tedious labor would be required, to arrange the two-thousand-odd photographs in their most effective order and to write a few pages of carefully built explanatory text. Prof. Humphreys undertook this labor himself. A publisher would have to be found. The McGraw-Hill firm accepted the book gladly, though they knew they would be doing well to break even on it financially. The whole way was not easy, but such was the charm of Wilson Bentley's pictures that everybody who had anything to do with the task shoul-

". . . CAPTURING IMMORTAL BEAUTY OUT OF GRAY SKIES . . ."
The late Wilson Bentley and his apparatus for photographing snowflakes.



dered his share willingly for the sake of the end they all sought.

Only Wilson Bentley himself hesitated, with characteristic self-effacement and equally characteristic New England caution.

"Surely nobody's going to want a great big book like the one you are talking about," he said to Prof. Humphreys. "Hadn't we better get out a *little* one first, and see how it'll go?"

But Prof. Humphreys had his way, and the book came out, and Wilson Bentley had the great satisfaction, in his last days, of seeing his work in permanent form. In it the eminent scientist, who was proud to have his name set down as co-author with that of plain, untitled Wilson A. Bentley, tells something of the technique used in capturing the breath-taking beauty that flocks through the many pages of pictures.

Snow Surgeon

"Breath-taking" is the right phrase, too; for when you look at a snowflake through the microscope you must hold your breath. The warmth of the slightest puff from human lungs melts it at once; even the radiation from one's body will destroy it in a short time.

So the first requisite for a snowflake photographer must be a willingness and an ability to work in the cold. A picture of Wilson Bentley at his microscope-camera shows him in a thick overcoat and with his hands encased in substantial woollen mittens. How he was able, in this necessary armor against the cold, to perform swift and delicate manipulations that would put severely to task a neural or optical surgeon is one of the mysteries of his craft. Perhaps that is one of the things that come with practice—and Wilson Bentley had forty years and more of that.

The task of transferring the evanescent beauty of the snowflakes to the more permanent record of the photographic plate is well told by Prof. Humphreys himself:

"First you catch your snow crystal. This is conveniently done by holding a smooth black board, a foot or so square, a moment or two, or as long as necessary, in the falling snow. The catch is then taken under shelter, to keep it from being blown off the board or otherwise disturbed, where the light is good and the temperature that of outdoors. After a hasty inspection with a suitable magnifying glass a promising crystal, if one is found, is transferred carefully and with most delicate touch to a suitable glass plate—a microscope slide—with a small wooden splint, and there pressed down flat or brought into other proper position and made slightly to adhere to the glass by the gentle stroke of a small wing feather. After this it should be more minutely examined with a microscope to determine whether or not it is worthy of photographic preservation. If it seems to be worthless there is nothing to do, of course, but start all over again. When, however, a photograph of a crystal is to be obtained it obviously is necessary to take it with a photomicrograph camera, that is, a microscope fitted with a camera bellows and plate holder where the eyepiece normally is placed, or farther removed. The camera is turned toward the sky (clouds actually) either directly or through a window; then, or previously if more convenient, the crystal, adhering to the glass slide, is properly centered in front of a low-power, ½ to 3-inch microscope objective, and the focusing so adjusted as to give a picture of the desired size. The plate holder is then put in position, lens covered, slide of plate holder drawn, lens uncovered for time of exposure, lens covered again, and slide put back."

It all sounds very simple. But just try and do it!

But the handling of the snowflakes themselves is only a part, though perhaps the most difficult part, of the task of snowflake photography. There is yet another delicate operation that must be performed before the image can be transformed from the developed plate to photographic paper.

As the original plates come out of the dark-room, there is not much contrast between the picture of the flake and the background, for the exposure is necessarily made against a gray sky. To obtain this contrast, Mr. Bentley made a duplicate of each plate, and then carefully peeled all the background emulsion away with a very sharp knife, leaving only the clear glass around the image. Then when he made his print he got the image standing out in all its lacy delicacy against a dead-black background.

The hair-fine lines on a snowflake picture, that make it like a jewel, like a wrought silver brooch, like a pattern of lovely lace, are not really dark marks on its surface or in its substance. The whole of a snowflake is just a crystalline bit of ice, quite without color. But though a snowflake is one crystal, its unity is a manifold unity; it is a many-in-one. It is made up of united smaller crystals that have grown in harmony from a small original nucleus at the center. All of these smaller crystals let light straight through in certain directions, and turn it sharply aside in other directions. Where the light is turned away from our eyes it naturally seems to leave a dark line. Thus the markings on a snowflake.

Fascinating and Baffling

It is fascinating—and baffling—to go through the collection of snowflake pictures, seeking duplicates. There are none. In his forty winters of snow study and photography, Wilson Bentley never saw two snow crystals exactly alike. Instead, he found the most bewildering variety.

While he was arranging the pictures, Prof. Humphreys was not always the scientist. Often he was the imaginative small boy, seeing birds and butterflies and flowers, and even milk-bottles and the heads of hippopotami. He points out some of them in the book, but wisely leaves most of these fascinating little voyages of discovery for the beholder to make for himself.

But even as the serious scientist, Prof.

Humphreys has things to point out that are of interest to everybody. For instance, that the shape and substance of a snowflake is determined largely by the height of the cloud from which it falls. The higher the cloud, the colder and drier the air, the more slowly the crystal forms and the "plainer" its outline. The small, even-sided, little-branched flakes are the children of the dizzy heights where haloes circle round the moon. The feathery, lacy, starry flakes, with endless intricate branches, are formed in damper air at lower temperatures, and at less lofty altitudes. The intermediate forms come from moderate heights, medium temperatures, middle-of-the-way conditions all round.

Older than Greeks

A perfect symmetry is rarely found in any snow crystal, even when its growth has not been violently disturbed. To the eye, most of Wilson Bentley's crystals appear flawlessly even in all proportions. But if one applies a rigorous measurement test one finds slight unevennesses. For instance, it is hard to find one pattern on which one can set down a pair of compasses and trace a circle that will just touch all six of its points, or on which one can lay down a ruler that will lie absolutely parallel with any of its sides.

For this hair's-breadth swerving from absolute mechanical accuracy, that satisfies the eye with symmetry and yet escapes a deadly sameness, the ancient Greek architects are much praised. But it appears that this idea in design is much older than the Greeks.

Science News Letter, February 6, 1932

ENGINEERING

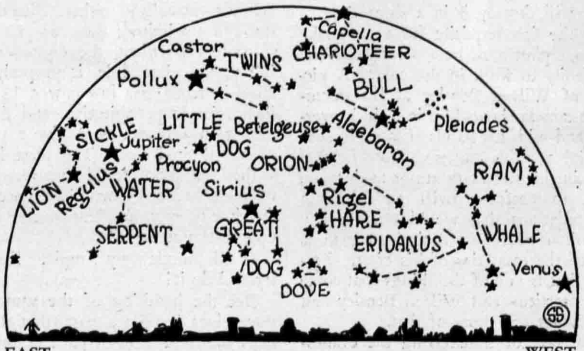
Streamline Type Challenge To Automobile Makers

BECAUSE it conforms to natural laws, not subject to the ingenuity of man, the streamlined automobile with its engine in the rear, is challenging manufacturers of the world's 28,000,000 motor vehicles to adopt it as the design of smart appearance which will give maximum riding comfort and greatest economy at high speed. This opinion is presented in a report to the Society of Automotive Engineers by Sir Dennistoun Burney. noted car designer.

Pointing out that the streamlined car would reduce air resistance by half, as compared with present-day designs, Sir Dennistoun explained how the distribution of weight in an automobile and the location of its center of gravity are of prime importance to safety and comfort. In order to give maximum adhesion to the road when brakes are applied equal strain must be placed upon each of the four wheels, and this may be achieved, he said, only when the engine is situated at a point one-third of the length of the wheelbase in front of the rear axle.

At ordinary driving speeds, Sir Dennistoun stated, the unpleasantness of an uneven road is most keenly felt. By arranging the weights along the length of the car according to a formula based on physical laws, he continued, it is possible greatly to reduce the magnitude of impacts and shocks which must be taken up by the springs of the modern car.

Science News Letter, February 6, 1932



THE GREAT WARRIOR

This map of the southern skies during February should replace the one published last week on page 71 with the article "Reforming the Stars." In that map there was a duplication of the planet Jupiter and an incorrect showing of the planet Mars, the result of an art department mistake. Familiar Orion, most magnificent of the constellations, occupies the center of the southern stage.

BOTANY

Fundamental Fact Discovered In Study of Root Disease

SEEKING information on a problem in plant disease, three Texas scientists, Dr. W. N. Ezekiel, Dr. J. J. Taubenhaus and J. F. Fudge, have come upon a fact that apparently is of fundamental significance for all botany. They have discovered a basic distinction in chemistry between the two great groups of the higher seed plants, which seems to be as clear-cut as their distinction in form.

They made their discovery during the course of investigations on the fungus disease of plants called root rot, one of the most serious of agricultural scourges in the southwest. They reported it at the Fifth Annual Conference on the Progress of Root-Rot Research at Austin, Texas.

It had previously been discovered that all plants susceptible to root rot belong to the group known to botanists as dicotyledons; this includes such important southern crop plants as cotton, sweet potatoes, carrots, etc. Plants resistant to the attack of the fungus all belong to the group called monocotyledons; this includes corn, sorghum, and all other grains and grasses. In practice, these are rotated with non-resistant crops to give the fungus time to die out of infected soil in the fields.

The three workers pressed the juice out of both susceptible and resistant plants, and planted inoculations of the fungus in tubes of each kind, properly sterilized beforehand. They found uniformly that the fungus cultures flourished on the juice of susceptible plants, and either refused to grow or at best made but an inferior growth on the juice of resistant plants. This is held to indicate the presence of some growth-inhibiting compound in the juice of monocotyledons that is either absent or at least not present in sufficient quantity in the juice of dicotyledons, thus marking the two great divisions of the higher seed plants into contrasting chemical categories.

"Modern" Improvement

It is pointed out that the "monocots" are of more recent evolution than the "dicots"; so that this biochemical difference, which works to the advantage of the former in the presence of the root-rot fungus, is a "modern" improvement. The susceptibility of the "dicots" is shared by the still older plant group that includes the common conifers.

The inhibiting substance in the resistant juices, whatever it is, must depend for its potency on its natural concentration; for when the resistant juices were diluted to one-fourth with distilled water they lost their power to stop the growth of the fungus.

Science News Letter, February 6, 1932

PHYSICS

Photographs Record High Speeds of Atomic Hearts

WORLD RECORD speeds of hydrogen atomic hearts, pushed along by the pressure of 1,000,000 volts, have been photographed, investigators at the Department of Terrestrial Magnetism of the Carnegie Institution of Washington have announced to the American Physical Society. Their speed was 13,400 miles per second.

The high-speed protons, as the hydrogen atom hearts are called, were allowed to plunge into a moist atmosphere in a Wilson cloud chamber and snapshots were taken of the tracks made in the cloud by the atomic projectiles.

The three physicists who did the work, Dr. M. A. Tuve, Dr. L. R. Hafstad and Odd Dahl, won the $1,000 prize of the American Association for the Advancement of Science 1930-31 meeting for previous high voltage work.

Million-volt protons had been produced and measured by magnetic means in the same laboratory last year but this is the first time their paths had been photographed.

The speeds, of which the photographs are evidence, are the greatest yet obtained for artificially speeded protons. Protons of somewhat higher speed are produced when naturally produced alpha particles from radium are allowed to bombard paraffin. About one proton is given off for each million alpha particles. Artificial production by the Carnegie Institution method gives much larger quantities of the speedy protons than could be obtained even if large amounts of radium were used.

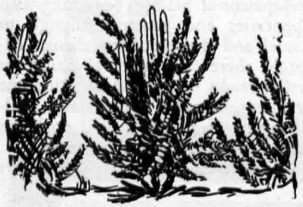
A high voltage tube of special design was used with a Tesla coil to produce the minute but relatively massive particles, but the three experimenters are now experimenting with the electrostatic generator devised by Dr. R. J. Van de Graaff as a better source of even higher voltage electrical current.

Science News Letter, February 6, 1932

BOTANY

Nature Ramblings

By FRANK THONE



A Geological Relic

PROBABLY everyone has noticed, perhaps without observing very exactly, the fine-twigged green stuff with very sharp-pointed, tiny leaves, used in Christmas wreaths and garlands under the name "ground pine." The name is not wholly inappropriate, for as it grows in its natural habitat the plant does look a good deal like a fairy pine tree only a few inches high, and frequently with inordinately large, long cones, such as the picture shows.

However, the plant itself is not really a pine, nor even closely related to the pines. It belongs to the fern family, and to that peculiar and (evolutionally speaking) far advanced branch of it known as the Lycopods or club-mosses.

In its geological history the ground-pine serves as a connecting link between the very remote past and the present. Back in the Age of Coal its kindred were giants, standing yards high where the ground-pine stands inches, with trunks several feet in circumference and leaves a foot long. There were no trees of the kind we know then, nor anything much resembling modern seed-plants, and these were the giants of the primal forest. But times changed, the climate perhaps became unfavorable, the competition of the rising generation of seed-plants proved too much for these dinosaurs of the plant world, and so they passed away. Only the dwarfs of the family escaped, squatting among the feet of the new lords of creation, holding on to life, perhaps, through their very inconspicuousness and inassertiveness. They are the meek, and though they do not inherit the earth, they have at least retained enough of it to live on, when their high-headed cousins of the days of the giants were cast out utterly.

Science News Letter, February 6, 1932

BACTERIOLOGY

Germs Found to Grow Even At Refrigerator Temperature

CONTRARY to general opinion, germs can grow even at icebox temperatures, Prof. Samuel C. Prescott, head of the department of biology and public health, Massachusetts Institute of Technology, told members of the American Society of Refrigerating Engineers.

Most germs or bacteria, whether harmless or disease-producing, grow best at temperatures above the internal temperature of man's body, which is 98.6 degrees Fahrenheit. When the temperature is lowered to 50 degrees or less, the growth of the germs is markedly checked, Prof. Prescott explained. For that reason, food handlers, whether the housewife or the groceryman or the dairyman, have felt that when they kept food at an icebox temperature of 50 degrees or less, they were preserving the food because the cold temperature checked the growth of any bacteria.

Recent experiments, however, show that some germs can readily adapt themselves to these cold temperatures, and after a lag of a few days, can start to grow and multiply quite actively again. When foods are actually frozen, however, this cannot happen, because the water in the germ cells as well as that in the foods will be frozen and no cell activity, such as is necessary for multiplication, can take place. This justifies the complete freezing of highly perishable foods, such as poultry, game and fish.

He described his experiments on the effect of temperature on bacteria. From them he concluded that in food technology and handling more importance should be attached to the behavior of specific germs, and it should not be assumed that all germs are likely to behave alike, regardless of their species or group relationship. In other words, if the food to be kept is apt to have a certain kind of germ in it, that germ should be studied to find the conditions that will actually check its growth.

Science News Letter, February 6, 1932

ASTROPHYSICS

Sinai's Neighbor Mountain May Carry New Observatory

A MOUNTAIN peak only a dozen miles from Sinai, where Moses received the Tables of the Law from on high, may become the seat of a new observatory of the Smithsonian Institution, for the measurement of the sun's daily gifts of light and heat to the earth. Alfred F. Moore of the Smithsonian staff is now on his way to investigate the possibilities of Mt. Saint Catherine, an 8,540-foot peak on the Sinai Peninsula, as a new location for the Institution's African station for the study of solar radiation.

Science News Letter, February 6, 1932

• First Glances at New Books

Ethnology

THE SONG OF QUETZALCOATL—John Hubert Cornyn—*Antioch Press,* 207 p., $4. The character and history of Aztec literature is described in sixty-seven pages of introduction by the author. Twenty-five poems from Aztec material gathered by the monk, Bernadino de Sahagún, shortly after the Spanish Conquest, are translated into English trochees, simulating the originals in meter. They cover a variety of subjects, from history, war, magic, politics, love, religion, nature, and the like. Glimpses are thereby given into Aztec modes of thought, out of a strange world that has disappeared into the past.

Science News Letter, February 6, 1932

Zoology

DOGS OF TODAY—Harding Cox—*A. and C. Black,* 127 p., $2. Sixty photographs of excellent specimens of the best-known dog breeds, with brief but adequate discussions of origin, habits and value by a leading English dog fancier.

Science News Letter, February 6, 1932

Geography

FRANCE: A REGIONAL AND ECONOMIC GEOGRAPHY—H. Ormsby—*Dutton,* 515 p., $6.50. Whoever would understand the nation that now dominates the world stage must understand the French peasant, and whoever would understand him must know something of the soil in which his feet are rooted, and of its history and its present influences. For this reason the present thorough study by a University of London lecturer has a special interest and value.

Science News Letter, February 6, 1932

Economics

OUTLINES OF AGRICULTURAL ECONOMICS—Henry C. Taylor—*Macmillan,* 614 p., $3.25. A revised edition of a successful textbook that has already gone through several printings.

Science News Letter, February 6, 1932

History

THE WORLD WE LIVE IN AND HOW IT CAME TO BE—Gertrude Hartman—*Macmillan,* 357 p., $5. A very delightful, popularly written book for "young people." Passing swiftly from the origins of the world and of life to the first adventures of man with fire, inventions, and animals, the drama of the world progresses to the ancient civilizations and thence to feudal days and on to our own age of machines and the conquest of the air. One of the most pleasing features of the book is the large array of pictures which admirably convey the feeling of the ancient, the medieval and the modern.

Science News Letter, February 6, 1932

Botany

INTERNATIONAL ADDRESS BOOK OF BOTANISTS—The Bentham Trustees—*Baillière, Tindall and Cox, London,* 605 p., $3.50. The Fifth International Botanical Congress, which met at Cambridge in 1930, recognized by resolution the need of a new international address book of botanists, and made provision for its publication. The committee entrusted with this work has done most commendably in completing its task in so short a time and in making the new list so complete and convenient to use. The list is geographically arranged. Under each country, botanical institutes are listed first, in order of locality name; then in alphabetic order the names of all the botanists, with address, connections and special interests. Finally, there is a reference index, listing all botanists in a single alphabet. It is to be hoped that this excellent list will be kept up to date by the issuance of revised printings at suitable intervals.

Science News Letter, February 6, 1932

Astronomy

MICROMETRIC MEASURES OF STAR CLUSTERS—E. E. Barnard—*University of Chicago Press,* 106 p., $4. A new publication of the Yerkes Observatory, giving tables that will be of value to the working astronomer.

Science News Letter, February 6, 1932

History of Science

THE STORY OF LIVING THINGS—Charles Singer—*Harper,* 572 p., $5. A scholarly, freshly-written history of the development of biology, beginning with Hippocrates and running through to Mendel and the post-Mendelians. Although there are already numerous parallel books on the market, this one combines substantial content and readable style so well that it will doubtless make a permanent place for itself.

Science News Letter, February 6, 1932

Education

RADIO AND EDUCATION—Edited by Levering Tyson—*University of Chicago Press,* 271 p., $3. The proceedings of the first annual assembly of the National Advisory Council on Radio in Education. Of interest especially to those who face the problem of placing educational programs before the radio public but also to any who would like a glimpse behind the microphone.

Science News Letter, February 6, 1932

Public Health

THIRTEENTH ANNUAL REPORT—*The Commonwealth Fund,* 66 p. Among the activities carried out under the auspices and with the aid of The Commonwealth Fund during the past year are the postgraduate training of physicians from small towns and country areas; the development and extension of the service of six rural hospitals built with aid from the Fund; improvement in local public health service in rural areas; and a study of the Interstate Commerce Commission. These and other activities are described in the annual report, which will interest a wide range of readers.

Science News Letter, February 6, 1932