



EDWIN E. SLOSSON, EDITOR
HOWARD D. WHEELER, MANAGER

SCIENCE SERVICE

1701 MASSACHUSETTS AVENUE

TELEPHONE, MAIN 2615

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(Editors: This is another of that series of exclusive Science Service interviews)

THE NEXT GREAT STEP AHEAD

4. In Evolution

An interview with Dr. Vernon Kellogg, permanent secretary of the
National Research Council

(By Science Service)

To learn by intensive study how to make useful to everyday present human life the scientific facts about heredity and prehistoric man that have been brought to light recently by the biologist and the anthropologist will be the next progressive step in evolution. This is the opinion of Dr. Vernon Kellogg, formerly professor of entomology at the Leland Stanford Junior University, and now permanent secretary of the National Research Council that is engaged in the big job of making science aid mankind in the most effective way possible.

"More has been learned about heredity since the days of Galton and Mendel in the second half of the last century, and more about the character and history of Glacial Time man since the beginning of this century than had been learned in all previous time," he explains.

"If human-kind of today is descended from a prehistoric human-kind -- and all biologists and anthropologists are convinced of it -- we want to know all we can about those primitive ancestors of ours who lived a hundred thousand or more years ago. We may find in this knowledge clues to some of the problems that human life presents today."

"If heredity is the deciding factor in determining what a man can or cannot do in this world -- and there is constantly growing evidence that if it is not the deciding factor it is at least a very important one -- we want to know all we can about it so that we can take this knowledge into account in our work of education, prison reform, correction of defectiveness and delinquency, and other matters in which we hope to do so much for the race by the use of good environment. We need to know just how far good environment can offset bad heredity. Also we want to use in a practical way our knowledge of heredity in the work of breeding better domestic animals and plants, and even human beings."

"We know now that primitive man was a good deal of a beast both as to structure and mind, and that much of what is beastly in us is a carry-over from these half-beast ancestors of ours. But by gradual evolution man has moved forward more and more toward real humanness, and by adding to this natural evolution all that we can in the way of education, good environment and an expanding social inheritance, we can look forward to a better and better future type of man."

SUN SPOTS AFFECT
ATMOSPHERIC ELECTRICITY

(By Science Service)

(The magnetic storm of the middle of May coinciding with the appearance of an unusual eruption of spots on the sun has again attracted public attention to the unsettled question of electrical relations between the earth and the sun. It has been known that disturbances in the solar atmosphere are connected in some way with shifting of the magnetic currents of the earth and with the display of northern lights. The following important statement secured by Science Service from the Department of Terrestrial Magnetism of the Carnegie Institution of Washington shows that there is another solar effect on the earth, a change in the electrical charges of our atmosphere due to sun spot activity.)

Washington, June .- The severe magnetic disturbances and earth currents which accompanied the remarkable sun-spot activity and brilliant display of polar lights during the period May 13 to 16 drew renewed attention to the relationships between these four classes of natural phenomena, connections between which had been worked out previously by various investigators on the basis of observations extending over several sun-spot cycles.

According to recent investigations by the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, it has been found that there is a fifth natural phenomenon - atmospheric electricity, which also appears to be related in some manner with sun-spot activity. On account of the many disturbances to which the electric elements of the atmosphere are subject, as for example during cloudy and rainy weather, it has been more difficult to establish the existence of a correlation between variations of atmospheric electricity and those of solar activity during the well-known sun-spot cycle of somewhat over eleven years than has been the case with regard to magnetic effects, earth currents, and polar lights. The accumulated data obtained in atmospheric electricity at various observatories during a period of about two sun-spot cycles, have been utilized in these investigations. The conclusion reached appears to be confirmed also by the observations pertaining to atmospheric electricity made on board the "Carnegie" during her various cruises. It would thus appear that atmospheric electricity, like terrestrial magnetism, is also in part, at least, controlled by cosmic factors.

Unfortunately, owing to cloudy weather at Washington during the period of chief interest, it is not possible at present, until a more detailed study has been made of the electrograms obtained at the laboratory of the Department of Terrestrial Magnetism, last month, to determine whether any effect pertaining to atmospheric electricity is to be associated with the recent manifestation of increased solar activity.

According to the information received from the Director of the U. S. Coast and Geodetic Survey, it would seem that the magnetic disturbances during the period May 13 to May 16, while severe, were not as great as have been noticed during other magnetic storms, as, for example, during the one which occurred on September 25, 1909, at the time when the "Carnegie" was at St. John's, Newfoundland, during her maiden voyage. Thus, for example, the recent magnetic disturbances caused a change in the compass direction in the vicinity of Washington of about 2° , whereas the one of September 25, 1909, produced a change in the compass direction in the vicinity of Washington of about 5° in 14 minutes of time.

(Editors: Here is another week's supply of this short daily feature)

BEAT EDISON TO IT!

Do you know that-

Sunlight is something like 618,000 times as bright as the light of the full moon.

The petroleum resources of this country are 40 per cent exhausted, and the available supply underground will last only 16 years at the present rate of consumption, according to the U. S. Geological Survey.

Eucalyptus trees are supposed to prevent malaria, and have been extensively planted in regions where that disease prevails. Probably whatever beneficial effect they exert in such cases is due to their power of drying the soil. On account of their rapid growth and great leaf surface they draw a vast amount of moisture from the ground.

The "equinoctial storm" is a myth.

Fresh water mussels are sedentary in habits and while they have the powers of locomotion, they seldom move.

BEAT EDISON TO IT!

Do you know that-

The "Festival of the Sun" is celebrated every year by a banquet of the Astronomical Society of France held on the Eiffel Tower on the night of the summer solstice.

The southernmost permanently inhabited spot on the globe is Laurie Island, in the South Orkneys, southeast of South America. The government of Argentina maintains a meteorological station in this inhospitable spot, which is generally ice-bound and has not even wireless communication with the rest of the world.

The amount of iron and steel manufactured each year in the United States is at the rate of about 900 pounds for every man, woman and child in the country.

An acetylene light station off the coast of Hawaii burned for ten years untended.

The Mer de Glace, the most famous of Swiss glaciers, moves an inch an hour in the center in summer and half as fast in winter.

BEAT EDISON TO IT!

Do you know that-

Between 300 and 400 volcanoes are known to be active at the present time. More than half of these are on oceanic islands, and most of the others are close to ocean shores.

The concentric ridges found on the scales of many kinds of fish, including salmon, trout, carp, flounder and cod, indicate the age of the fish, much as the rings seen in the cross-section of a tree trunk show the age of the tree.

The Philippine Islands are said to offer ideal conditions for the cultivation of quinine, an industry now nearly monopolized by Java and British India. At present there is one small quinine plantation in Baguio, under the supervision of the Philippine Bureau of Forestry.

About 10 per cent of the gasoline produced in the United States is made from natural gas.

Fine dust discharged into the upper atmosphere by the eruption of Krakatoa, August 27, 1883, was responsible for the magnificent red sunsets observed over a large part of the earth during the subsequent years. The story is told of an American fire brigade which, deceived by one of these brilliant sunsets, set out to extinguish what was mistaken for a great fire in a village to the westward.

BEAT EDISON TO IT!

Do you know that-

The Mongolian antelope can run at a speed of at least 60 miles an hour, according to Mr. Roy C. Andrews, of the American Museum of Natural History.

The Chinese and Japanese dug oil wells in the early centuries of the Christian era. Some of them were as much as 900 feet deep.

The dye most widely used in this country is sulphur black, which is prepared from carbolic and nitric acids. In 1919, thirteen American manufacturers produced a total of 14,500,00 pounds, some of the brands being superior to the finest imported from Germany before the war.

The polar snow-caps of Mars not only grow and shrink with the Martian seasons but also vary in size from year to year, apparently on account of fluctuations in the amount of heat given off by the sun.

Guillaume Amontons, a French physicist of the 17th century, having lost his hearing when a boy, refused to be treated for his deafness, declaring that the admission of common noises to his brain would interfere with his scientific studies.

BEAT EDISON TO IT!

Do you know that-

The "parsec," a unit of distance used by astronomers, is the distance light travels in about 3.3 years, or 20,000,000,000,000 miles.

Several kinds of self-winding watches have been made. In some of these the winding is done by the operation of opening and shutting the cover a few times a day. The "pedometer" watch is wound merely by the motion of the wearers' body.

The optophone is an instrument that enables totally blind people to read ordinary printed books and newspapers. Beams of rapidly intermittent light are reflected from the print upon a selenium preparation, which produces sounds in a telephone receiver varying according to the shape of the letters.

There are several species of climbing fish. One species, a catfish found in Columbia, can climb, by means of suction apparatus, not only up the steeply inclined bed of a mountain torrent but also up a smooth vertical rock. A naturalist observed some of them climb a vertical distance of 18 feet in half an hour.

Bread is often sold by the slice, not the loaf, in the foreign quarters of New York.

BEAT EDISON TO IT!

Do you know that-

Nearly 200,000 accidents to the eyes of workmen occur every year in the United States.

In twilight red colors rapidly appear black and soon disappear. The blues and yellows are not affected as much as the red by a decrease in illumination. It is always best to have good daylight illumination when matching red dress goods.

The Canadian Government owns the largest herd of bison in the world, comprising upwards of 3,500 animals. These bison are kept at Buffalo Park, Wainwright, Alberta.

A bushel of wheat now represents only ten minutes of human labor, instead of three hours, as it did before the days of labor-saving machinery.

Hiawatha ran at the rate of 46 miles an hour if, as Longfellow says:

"He could shoot an arrow from him
And run forward with such fleetness
That the arrow fell behind him!"

A NEW PARASITE
FOUND IN MAN

(By Science Service)

Washington, June .-- There is a parasitic infection of man in the form of a small worm, about one-seventh of an inch long, that seemingly has a wide distribution in the south, but which is rarely recognized.

The third definite case of infection by this Gongylonema worm in the human body has just been reported by Dr. C. W. Stiles, chief of the division of zoology, of the United States Public Health Service, who has won honor for his work on the hookworm. This new human infection is similar, if not identical, with the worm found widespread in cattle, sheep, mice, rats and other animals.

The human infection, according to Dr. Stiles, doubtless occurs through swallowing insects, perhaps the croton bug, a light-colored cockroach. Present evidence is to the effect that the presence of this worm produces an irritation with resulting nervousness, but evidence is lacking that it will cause any dangerous condition. The latest case is that of a woman who was able to remove the worm from an irritation on the inside of her mouth with her fingers.

HIGH COLLARS AND
HIGH TEMPERERS

(By Science Service)

Dr. Leonard Williams of London says that women have become sweeter tempered since they have given up high collars and taken to wearing garments that give complete freedom to the neck. Tight collars impede the drainage of the blood from the brain and so have a bad effect upon the health and disposition of either men or women.

STRANGE STONE HEADS
IN SOUTH SEA ISLANDS

(By Science Service)

Honolulu, Hawaii. June .- A large rock with pictographs in a style unlike that of any previously found there has been discovered at Atuona, Hiva-Oa in the Marquesas Islands by Ralph Linton, who is engaged in archaeological work in the party of Prof. H. E. Gregory, director of the Bernice Pauahi Bishop Museum here.

While this expedition has found the native averse to the excavation of their old sacred sites and the collection of the human skeletons found in the ruins, the exploration has brought to light this carved stone which is declared to be decidedly non-Marquesan. Archaeologists consider this find of great importance in Polynesian ancient history.

This rock is at one end of an enormous structure decorated with heads of regular Marquesan form. The decorated ruin which is considered the highest development of Marquesan stone work, is a series of three platforms, the first ten feet high, 180 feet long, and forty feet wide, built on a hillside. These stones are large and accurately fitted, and the second terrace is decorated with gigantic stone heads inserted in the masonry at irregular intervals.

RADIO AND WEATHER SCIENCES
UNITE TO AID AVIATION

(By Science Service)

Washington, June .- Radio bulletins sent out from the Navy radio station at Arlington, Va. at 10:30 o'clock each morning are now giving weather data on both surface and upper air conditions that has been gathered by the U. S. Weather Bureau. This special service, begun this month, has been placed in operation to give fundamental meteorological information to the aviation and marine interests in all parts of the country.

Use of forecasts and warnings based on observations made each morning at forty-four surface weather stations and nine aerological stations will make aviation safer and, if heeded, will tend to diminish the chances of such fatal airplane accidents due to weather conditions as occurred here just before these bulletins were begun.

A portion of the daily wireless bulletin is in a numerical code. For instance, five figures, 30855, mean cloudy weather, change in atmospheric pressure less than .04 inches during the preceding two hours, nearly all of the sky cloud covered with cumulus clouds moving rapidly from the south.

UNIVERSAL PATENTS TO BE DISCUSSED
BY INTERNATIONAL CHEMICAL UNION

(By Science Service)

Washington, June .- A form of international patent that would gradually tend to unify the present wide divergence in patent procedure among the different countries will be one of the subjects to be discussed at the meeting of the International Union of Pure and Applied Chemistry that will meet in Brussels, Belgium, on June 27.

The first step in such a program would be the establishment of a central international office where the specifications and claims might be got into a standard form acceptable to all of the countries and the novelty and the patentability of the invention or discovery determined as far as possible by an examination somewhat similar to that made in our own patent office. It is expected that this phase will be discussed at the coming meeting.

The American delegates now on their way to the meeting are: Dr. F. G. Cottrell, chairman of the division of chemistry and chemical technology of the National Research Council; Prof. James B. Conant of Harvard, and Dr. Hugh S. Taylor, professor of physical chemistry at Princeton. Dr. E. S. Chapin and Dr. Collin McCall, the other delegates from the United States are now in Paris.

Among other questions that will be discussed at the international meeting will be the organization of an international commission of atomic weights, reformation of the chemical nomenclature, the formation of an international laboratory for the analysis of food products, hygienic conditions of labor in the chemical industry, and the establishment of an international institute on chemical standards.

WHEN AND WHERE WIRELESS WORKS BEST

(By Science Service)

Radio

When electric currents are carried by wires it does not matter much where the wires are laid or what time of day it is. But when messages are transmitted by electric waves in free air the character of the ground and the atmospheric conditions make a great difference in the range of the signals.

Loggett's "Wireless Telegraphy" just published summarizes the most favorable conditions as follows:

1. The higher the mast bearing the aerial (the wires sending out the electric waves) the farther the signals will reach.
2. Certain forms of aerial will propagate more favorably in some directions than in other directions. For example an aerial having the form of an inverted L aerial will, at least over short ranges, propagate radiations more favorably in the direction of the foot of the L than in the reverse direction.
3. Transmission is easier over sea than over land, the range being further decreased if the land is mountainous, thickly wooded, or desert land.
4. The presence of mountains or high land between two stations hinders propagation while a river aids propagation.
5. The night range for a given transmitter and aerial is roughly double that of the day range, or even more if the range is, by day, subjected to brilliant sunshine. The period of the year has also a lesser effect upon transmission, doubtless due to the relative intensity of the sunlight and consequent ionisation of the atmosphere.
6. In long-distance work, great difficulty is experienced at the periods of dawn and sunset. Whereas during other periods both by day and night transmission may be relatively easy, at dawn and sunset it may often be quite impossible to maintain communication.
7. Transmission over tropical forests is exceedingly difficult, and is often entirely impossible over very short distances during the daytime even by use of transmitters having many times the range over non-tropical land.
8. For a given transmitter, increase in wave length, that is, decreased in oscillation frequency, permits a longer range to be obtained.
9. The power required for any range is not directly proportional, that is if the transmitted energy is doubled, the range, while increased, is not similarly doubled.
10. Longer ranges can generally be obtained in directions parallel to lines of longitude than in directions parallel to lines of latitude.
11. With a given aerial power greater distances can be obtained with continuous than with damped oscillations.

The Commonwealth of Australia recently established a Department of Health to administer its quarantine act, investigate diseases, establish laboratories, control the Australian Institute of Tropical Medicine, and deal with infectious diseases among discharged members of the Australian Imperial forces. Great Britain, Canada, and the Union of South Africa have previously established such departments.

WHO ARE THE BEST ENGINEERS? (By Science Service)

The American Association of Engineers has been conducting an investigation to find out who are the most highly regarded engineers in various branches of the profession. A partial count of the answers received to questionnaires submitted to the deans of engineering and scientific schools show for the three highest in each of five branches of engineering the following:

- Civil Engineers, - George W. Goethals, 27 votes; George P. Swain, 23; John R. Freeman, 21.
- Mechanical Engineers- John A. Brashear, 24; Orville Wright, 18, Ambrose Swasey, 18.
- Electrical Engineers- C. P. Steinmetz, 39; Elihu Thomson, 29; Thomas Edison, 28.
- Chemical Engineers - Leo H. Baekeland, 22; W. R. Whitney, 22; F.C. Cottrell, 19.
- Mining Engineers - Herbert C. Hoover, 32; John H. Hammond, 29; J. Spurr, 24.
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More than 900,000 square miles, or 28 per cent of the total area, of the Dominion of Canada is still unexplored. This does not include the Arctic Islands. A very large part of the map of Canada, as it now appears in the atlases, is based upon vague and untrustworthy information.