SCIENCE NEWS

Science Service, Washington, D. C.

THE ETHER DRIFT

MEASUREMENTS of the drift of the ether, supposed to pervade all space, which were carried on by Professor Dayton C. Miller, of the Case School of Applied Science, Cleveland, during the last summer at Mt. Wilson Observatory, seem to prove that the ether exists and that the Einstein theory is not correct. This announcement was made at the meeting of the Optical Society of America at Ithaca.

The possibility of experimental data not agreeing with the Einstein theory was tentatively reported by Professor Miller to the National Academy of Sciences last spring and an article by him on the subject has been printed in SCIENCE. The ether was found to drift more on the top of high Mt. Wilson while there was evidence that the ether clings to the earth closely in the cellar of Professor Miller's laboratory in Cleveland.

Since spring, Professor Miller has made a total of one hundred thousand measurements. At least two months will be required to compute the final results, but so far they seem consistent with the earlier work.

His research also shows that the sun is moving through space, carrying the earth and the other planets with it, to a point near the bright star Vega, in the constellation of the Lyre. This is in close accordance with astronomical measurements made at Mt. Wilson and the Lick Observatory of the University of California.

RADIO MESSAGES BY PICTURE

THE fac-simile radiogram commercially available within a year is the promise of radio, according to Major General James G. Harbord, president of the Radio Corporation of America, addressing a conference on education and industry at the University of Chicago. This is the fruit of long research work done in radio photograms. The received copy is a fac-simile of the original and its accuracy will be beyond question. The speed at which this work is being done is said to promise commercial value before the return of the next summer's static.

The problem of communication with Europe, General Harbard predicted, would also be solved in the near future. He mentioned the question of wavelength with regard to international communication. "The wave length," he said, "is a species of property. Losses in money and prestige would follow the deprivation of a particular wave length to which right had been established by actual use. These matters will have to be considered at an international conference, a form of calamity which has not yet afflicted the radio field, but is constantly threatening. An international conference can not be much longer delayed."

General Harbord painted a brilliant future for radio. He said in part: "It is not given to mortal man to read the future of an art with such undreamed possibilities. That it will grow to be one of the towering industries of our country may be safely ventured as a prophecy. In international communication I can visualize a world even more completely linked together. Every part of the world is destined to benefit by improved communications. Entire written messages, perhaps newspapers, will be flashed as complete pictures or documents. Efficient communication with commercial aircraft will be ready probably before the aircraft are provided. Marine service to and from and between ships will even more completely minimize the perils of the deep. Television is not far distant. Static will be chained a captive at the wheels of radio progress. International broadcasting will become a commonplace. The operas of Europe will compete with our own. The incomparable music of the countries to the south of ours will be heard in American homes. Entertainment and instruction will penetrate to the remotest corners of the earth. In time of national crises or great emergency, presidents will appeal to our millions in tones of voice that will be recognized. The temple bells of Asia will chime for us, and from the land of old religions will come the philosophies of ancient races. The oldest and newest civilizations will throb together at the same intellectual appeal and to the same artistic emotions."

THE AUTOGIRO

"THE most important step in aeronautical progress since the Wright brothers flew the first airplane." This is the way in which Vice-Marshall Sir Sefton Brancker, of the British Air Force, described the interesting combination of airplane and helicopter, the autogiro, invented by Juan de la Cierva, Spanish civil engineer, which has had trials at Farnborough recently.

It has been announced that as a result of these tests several machines with modifications will be built for the air ministry.

The autogiro is an airplane that has had its wings clipped, as it were, and it has a second propeller on a vertical axis above the fuselage which exerts a force downward, tending to keep the craft from falling. This vertically mounted propeller is similar in shape to the conventional propeller with which an airplane is equipped, but it has a diameter equal nearly to the wing spread of the craft itself.

When the air-screw on vertical axis is started with sufficient power to give 120 revolutions per minute, the autogiro leaves the ground with the very low ground speed of fifteen miles an hour, according to measurements made during the Farnborough tests.

The autogiro invented by Senor de la Cierva and recently tested in England was first tested in October, 1920, just five years ago.

Although leading aeronautical experts connected with the government at Washington do not share the reported optimism of the British authorities as to the importance

of the autogiro, yet its developemnt has been looked upon with interest.

Three years of experiments were necessary on the part of the Spanish inventor and his associates before a successful and satisfactory autogiro was developed. To understand the principle of operation of the autogiro, it is necessary to know that the ordinary airplane in order to be maintained in the air must have a high velocity. The lift or pressure upward that sustains the airplane in the air decreases much faster than the decrease in speed of the airplane and therefore a small loss in velocity of the airplane may result in a catastrophe.

In the autogiro, however, the sustaining lift is produced by revolving wings on a vertical shaft projecting from the fuselage of an ordinary airplane. However, although it may look like a helicopter, it does not really belong to that family since the sustaining propellers of the helicopter are operated directly by the engine, whereas in the autogiro the wind produced by the motion of the aircraft actuates the blades. If the craft had not been christened autogiro, it might be called an "airplane with revolving wings."

It is claimed that the autogiro is not affected materially by loss of speed. If there is an engine failure, a sudden "nose up" or a very sharp turn, the horizontal flight of the craft may be interrupted and it may be forced toward the ground, but the sustaining blades will keep it in the air and enable it to alight at a very low speed. The stalling of the engine while in flight over rough ground, which would be fatal to an ordinary airplane, would be a mishap of minor importance to an autogiro. On the other hand, it is admitted that the autogiro will probably be unable to do any looping or other stunts such as are performed by fighting airplanes.

THE MEXICAN BEAN BEETLE

DESPITE determined efforts of the U. S. Bureau of Entomology chemical warfare corps to dislodge it, the Mexican bean beetle army has held its own during the past summer and has even begun the conquest of another northern state. Although it has been in the South for five years, and has thoroughly established itself in the heart of Dixie, the beetle made no serious invasion of the North until 1924, when it annexed the state of Ohio, reaching the shores of Lake Erie at a number of points. This year it has widened its salient and established a line across the southeastern part of Indiana.

Elsewhere the depredations of the beetle have not extended greatly beyond last year's holdings; some eastward extension in the mountainous regions from Pennsylvania southward to North Carolina has taken place, but little new territory has been seized elsewhere. These small eastward drives, however, are causing officials of the Bureau of Entomology some concern; for if the insect army passes the natural barrier of the Appalachian chain it may overrun the Piedmont and Coastal Plain regions.

The Mexican bean beetle, according to J. E. Graf, who is in charge of the bureau's work on truck crop pest investigations, is a sneak as well as an enemy. for he appears in the uniform of a large lady-beetle, which we have always been taught to regard as a friend. But there are several lady-beetles in Mexico that prey on man's crops instead of on the enemies of his crops; this is the first that has invaded the eastern part of the United States, appearing, no one knows whence or how, in northern Alabama in 1920 and extending rapidly north and eastward each year.

Though the adult beetle does considerable damage, the real harm is done by the squashy grubs or larvae, which feed voraciously on the leaves of all kinds of crop and truck plants, skeletonizing the leaves and causing them to turn yellow. Thus far the only effective means of combat have been spraying and dusting with arsenical chemicals. The Bureau of Entomology has twice imported natural parasitic enemies of the pest from Mexico, but the parasites have failed to survive, while the beetle, apparently more easily adaptable to northern climatic conditions, has remained and thrived. What appeared to be a bacterial disease broke out among the beetles in Alabama a couple of years ago, but unfortunately the epidemic died out again. Government scientists are continuing their researches on diseases and natural enemies of the beetle, hoping that eventually a means of control less expensive and laborious than poison spraying and dusting may be found.

ITEMS

EITHER tortoises are deaf, or else much less intelligent than generally supposed, according to a report of experiments by Ryo Kuroda, of the College of Niigata, Japan, in the next issue of the *Journal of Comparative Psychology*. In previous experiments with snakes, Kuroda found that most water snakes have no hearing ability, while land snakes often have an acute hearing. To further this work, it was decided to experiment with the tortoise which is a more advanced member of the reptile family. An experimental group of several tortoises was used. Scraps of meat, which is a favorite food, were laid upon a broad copper plate which was connected with an electrical circuit. When the experimental animal attempted to snap the meat from the plate, a bell was rung and at the same time an electric current passed through the plate giving the animal a shock. If the animal were able to hear it would soon learn to associate the sound of the bell with the coming shock if the attempt to snap up the meat were made. Repeated trials with individual animals revealed no reaction to the bell sound associated with the electrical shock. As a result the experimenter was led to the conclusion that the tortoise does not have a developed sense of hearing.

CULTIVATED cotton may be crossed with a tree just rescued from complete extinction in Hawaii to make bigger cotton plants and take the kinks from the backs of cotton pickers. Such is the possibility foreseen as a result of the announcement received here of the success obtained at the Department of Agriculture's Plant Introduction Garden at Miami, Fla., in growing *Kokia Drynarioides* from seed. There is only one other tree of this species in existence and that is the one from which the seeds were obtained. It is a close relative to

the cotton plant, and it has been suggested may be of value for crossing with the cultivated cotton. It will take a few years, however, to get specimens in cultivation here. The experts now pin their hopes on getting more seed from the only parent tree at Kauluwai. Even if crossing does not succeeed this cotton tree will prove an attractive ornamental plant as it has long-stemmed, heart-shaped leaves, and bright-red silky flowers.

A STEAM boiler of revolutionary design has been produced by a German engineer-inventor, Bernard Becker, of Nohra, near Weimar. When stripped of its insulation, it is a cubical box only about eighteen inches on a side; but according to its inventor's claims it can produce over 600 pounds of steam per hour and can get up a pressure of 300 pounds per square inch in five minutes. Its action depends on the introduction of water not as a liquid, but as a spray of almost mist-like fineness. This is injected into an intensely heated coil of jointless tubing, where it is almost instantly converted into high-pressure steam. There is a small steam chamber, but no water reservoir. The new quick-steaming boiler is thought likely to be useful in automobiles and farm motors.

REVERSED SNAILS

IN the Science News Supplement of SCIENCE for October 9, 1925, appears the following:

"A given species will twist to the right or to the left, never both; for a 'left-shelled' snail to occur in a 'right-shelled' species is as unheard of as a man with his head on backwards."

Probably every one who has made a serious study of mollusks has seen, if he has not himself found, many reversed snails, as well as occasional reversed bivalve mollusks. They have been found in so many genera of widely separated families that there is no reason to doubt that they may sporadically occur in any genus or species. Usually only one or two reversed specimens may be found at a given locality, out of hundreds or thousands of normal examples, but species differ in this respect and in some genera numerous reversed specimens are sometimes found. In the genus *Oreohelix* almost any large colony, especially of the two most common species (*O. cooperi* Binney and *O. depressa* Cockerell), is likely to yield one or two reversed examples, but another species (*O. haydeni mixta* Pilsbry) at the type locality yielded about a dozen out of several thousand normal specimens. On the other hand, I have collected *Lymnaea* of many species and at many localities and have found but one reversed specimen; they have been found in abundance in some localities. The only reversed shell of the genus *Bittium* I have seen is a fossil one. *Pupilla syngenes* Pilsbry and Ferriss is normally dextral, but its variety *dextroversa* Cockerell is sinistral (left-handed), and two forms are often found mixed, though pure colonies of each are reported. The wonderful colonies of mixed dextral and sinistral snails of the Hawaiian Islands have long been known and much studied. Many naturalists have hoped that the intensive study of such colonies would ultimately throw important light upon the problems of evolution. In most genera the reversed examples are so scarce and sporadic that it is almost impossible to obtain material for breeding purposes, but in the Hawaiian and other Pacific islands they are so abundant that no such difficulty is encountered. However, even in other regions enough material has been found with which to experiment in the breeding of reversed examples representing quite a number of genera of snails,[1] the results of which have a very important bearing upon the problems of inheritance, whatever their effect may ultimately be upon the problems of evolution.

Since the foregoing was put into type, Dr. Henry A. Pilsbry has called my attention to the very interesting fact that some snails, such as *Lanistes*, have sinistral shell with dextral animal.

JUNIUS HENDERSON

UNIVERSITY OF COLORADO

THE ELECTRIC SQUIB

IN the number of SCIENCE for October 9 appears an article "Scrap Iron and Dynamite Suggested for Frost Protection." While the exploding of dynamite in the air is, of course, useless for this purpose, there is an explosive accessory used successfully in some of the orange groves in southern California, which is called the electric squib. This is a device primarily intended for igniting charges of black powder by means of an electric current. It is also used for igniting charges of flashlight powder in photography and in the orange groves for igniting the oil pots by means of a thermostat connection with a suitable source of current. When the thermostat registers a temperature near the danger point for frost, the electric squibs are automatically fired, which in turn ignite the oil pots and start the heat in the orchards.

It is just possible that some observer, seeing these explosive accessories connected to the smoke pots, jumped to the conclusion that dynamite was in some way involved.

ARTHUR LAMOTTE,
Manager of the Technical Section of
E. I. du Pont de Nemours and Company

THE SPEED OF LIGHT

THE editor of *Science Service* wishes to have two corrections made in the note on the "Speed of light" appearing in Science News last week. It should be stated that the velocity of light has been measured to an accuracy of one part in 10,000. There should be substituted for the first paragraph on page xii the following: "If the velocity of light can be found accurately it will establish a new unit for time measurement. This unit is changing with time."

[1] See, for example: *Journ. of Genetics,* XV, 114–200, 1925; *Proc. Roy. Soc.,* 1925 (95-B), p. 207; *The Nautilus,* XI, 70, 1897; *ibid.,* XXXIX, 21–24, 1925; SCIENCE, n. s., LVIII, 269–270, 1923, and other publications discussing the breeding of reversed snails, together with very numerous reports of the occurrence of reversed snails under natural conditions.