

ASTRONOMY-METEOROLOGY

"Controls" the Weather

Changes in the sun's radiation may affect the earth's weather indirectly through variations in the thickness of "E" layer in outer atmosphere.

► WEATHER changes on earth may be indirectly controlled by changes in the sun's radiation, through variations in the thickness of the radio-wave-reflecting "E" layer of the earth's outer atmosphere. A close correlation between thickness changes in this layer and shifts in the weather has been found by Dr. Charles G. Abbot, research associate of the Smithsonian Institution, in a study of records extending over seven years.

Dr. Abbot has for many years followed the apparent connection between the weather and the solar constant, or total radiant energy received from the sun, as recorded daily at Smithsonian observatories in California, New Mexico and Chile. Changes in the solar constant are small and difficult to make at best—impossible under bad weather conditions. "E" layer thickness variations, on the other hand, are easier to measure and observations are not affected by weather. These thickness variations are also measured daily, by observers of the Carnegie Institution of Washington; the best records are those kept by the Carnegie stations at Huancayo, Peru, and Watheroo, Australia.

"It is clear," states Dr. Abbot, "that the sun's variations are a major factor in weather. The effects produced are large.

In Washington temperatures it makes nearly 20 degrees Fahrenheit of difference in some months whether the solar constant rose or fell by three-fourths of one percent a week or more previously. The effects are long continuing. They appear to begin three days before measurable changes in radiation occur, and to last at least until 14 days after, making an important sequence of at least 17 days in weather, attending each change of solar radiation.

"It appears that approximate predictions a week in advance could be made of dates of peaks and troughs of Washington temperature if daily reports of the 'E' layer were obtained from a sufficient number of ionization stations, and if means could be found to anticipate by a few days closely the date of the next approaching solar change. Its sign would always be known to be opposite to that last observed. From present records we should expect solar changes of the same sign to follow each other at intervals of about nine days, with changes of opposite sign intervening. There is, I think, a fair hope that such important dates as heavy frosts may become predictable a week in advance from solar observations by this method."

Science News Letter, November 17, 1945

GENERAL SCIENCE

Many Russian Scientists

The USSR has trained 3,900 for doctor's degree since 1937; 11,543 doctor's degrees in science were granted in the United States for the same period.

► IN SOVIET RUSSIA, 3,900 scientists were graduated from the colleges with the degree of doctor in the years 1937 to 1944; about 20,000 received a master's degree, according to Joseph Agroskin, vice-chairman of the Committee on Higher Education in Moscow.

The Soviet Government has been paying particular attention to the matter of training scientists, Vice-Chairman Agroskin said, because of the pressing need for teachers of technical subjects in

the colleges due to a greatly increased student body.

In 1929, there were only 26,000 engineers with diplomas in all the heavy industries of Russia. But in the last six years, about 80,000 engineers were graduated.

In pre-revolutionary Russia, Vice-Chairman Agroskin said, higher education was for the privileged few of the upper strata. In 1914, Russia had only 91 colleges with 112,000 students. The

Soviet Government placed the entire system of higher education on new principles. Nationality and class distinctions were abolished. Education was free. All nationalities were permitted to teach in their own languages in colleges on the territory of their own national republics. Both universities and institutes were opened to all working people.

As a result, there are now 772 colleges with 562,000 students. Of these 132 are industrial institutes, 18 transport institutes, 87 agricultural institutes, 68 medical institutes, 115 pedagogical colleges and 29 universities.

In 1925, Vice-Chairman Agroskin reported, there were only 17,900 professors and lecturers in all Russia's colleges. Now there are 40,000.

More in U. S.

► IN the United States, about three times as many doctor's degrees are granted to graduate students of science as those reported granted in Soviet Russia, according to an estimate based on figures appearing in the "Science, The Endless Frontier" report to the President by Dr. Vannevar Bush, director of the Office of Scientific Research and Development.

In the United States, according to the Bush report, an average of 1,649 doctor's degrees in the sciences were granted annually for the prewar years 1935-1940. This would mean about 11,543 for a period comparable to the seven years reported by Vice-Chairman Agroskin from Russia during which 3,900 scientific doctorates were granted in that country. The population of Russia is, however, much larger than that of the U. S.

Although the war will probably mean a drop in the number of candidates for the doctor's degree, the peak of this deficit is not expected to be felt until several years after the war when there will be fewer college graduates ready to enter training for advanced degrees.

Science News Letter, November 17, 1945

MEDICINE

Small Defects in Skull Repaired by Wire Mesh

► THE patient who has lost a small piece of skull, either because of disease or injury, may have it replaced with a wire mesh of stainless steel if his surgeon follows a method developed by Dr. Edwin B. Boldrey of the University of California Medical School in San Francisco. Announcement of the development has been made through the University.

The wire screen, Dr. Boldrey found,

is tolerated well by the body and is superior, he believes, to small bone grafts or bone dust previously used for filling small cavities in the skull. It is suitable for defects up to one and one-half inches in diameter. It might be used following operations for removal of a small brain tumor, drainage of a brain abscess and repair of a depressed fracture of the skull.

No ill effects of any kind have followed use of the wire mesh during the past eighteen months.

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GEOLOGY

Norwegian Geologists Will Study Rock Records

➤ RETURN of science in Norway to normal conditions is signalized by arrangements now being made for a geological research expedition into a high mountain area in the central part of the country, to study records left in the rocks and soil by the waning remnants of the last great Ice Age glacier. A communication to this effect has been received by the Geological Society of America from Dr. Kaare Munster Strom, president of the Geological Society of Norway.

The expedition, which will be in the field from about June 25 to July 5, will be under Dr. Strom's leadership. The size of the party will have to be limited because of lack of shelter in the rugged mountain country, but two or three American geologists may be included.

Science News Letter, November 17, 1945

INVENTION

Superheated Steam For Roasting Coffee

➤ USE of superheated steam for roasting coffee instead of the conventional dry roasting is advocated in patent 2,388,298, taken out by T. J. Stephens of New York City. The coffee grains are slowly poured into one end of a slowly rotating kiln-like cylinder with a spiral web inside to keep the mass distributed and moving towards the other end. The beans are subjected to the action of superheated steam throughout their course. The inventor claims that this process makes for better flavor, more cups of coffee per pound, and greatly decreased production of harmful unsaturated organic compounds in the roasted beans. He also states that the same process can be used for roasting nuts, grains and other vegetable products.

Science News Letter, November 17, 1945

GENERAL SCIENCE

Scientists Deferred

Those who are under 26 and have done war research for two years may now ask to be allowed to complete study for a science or engineering degree.

➤ YOUNG scientists under 26 years of age who have done research for at least two years on war projects such as the atomic bomb, antimalarial medicines, DDT, or radar may now ask for deferment from the draft in order to complete study for degrees.

No promises are made of deferment by Selective Service. Each case will be handled individually on its merits and must be recommended by an official of the Office of Scientific Research and Development.

This is the first step taken in response to recommendations made last July in a report to the President by Dr. Vannevar Bush, director of the Office of Scientific Research and Development, in which he pointed out the critical shortage of scientists in training to carry on essential research.

The new policy is based on a letter written by Secretary of War Robert P. Patterson to Maj. Gen. Lewis B. Hershey, Director of Selective Service.

This plan, proposed by the Secretary of War, takes care of only a small part of the urgent problem of insuring that the United States have available trained scientists for postwar research needed for industry and an adequate national defense.

It makes no provision for scientists under 26 who already have their Ph.D. degrees, although these men are perhaps the most valuable both for research and for the instruction of scientists in training. It takes at least six years to train high school graduates to research effectiveness.

Nothing is done about the scientists who up until 23 months ago were still in college and who interrupted their training to do war research. The plan only applies to men who have been engaged for two years or more on war research.

No provision is made for deferment of talented 18-year-olds who up until their eighteenth birthday were taking scientific training.

Nothing is done about getting thousands of scientists in our armed forces out of uniform and back into research or scientific training, which was one of the

strongest recommendations of the Bush report.

Nothing is done toward getting many scientists in the armed forces back into industry where they are needed for re-conversion and development of new products, as advocated by professional organizations such as the American Chemical Society.

Only those scientists who have been engaged on war research for two years or more and who now have been enrolled in a recognized college or university to complete work for a degree in science or engineering are affected. Such individuals, under this plan, may write to George W. Bailey, Office of Scientific Research and Development, 1530 P Street, N.W., Washington, D. C., sending a statement from their employer certifying that they have spent two years or more in war research, a statement from a university or college official that he has been accepted for enrollment, and also a short personal history.

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AERONAUTICS

Carrier-Based Plane Goes 500 Miles an Hour

➤ THE BRITISH Navy's announcement of the de Havilland jet-propelled plane, the Vampire, to be used as a carrier-based fighter, indicates a new advance attained by English jet-engine manufacturers.

Looking somewhat like the twin-boomed Lockheed P-38 Lightning, it is said to have a level flight speed of over 500 miles an hour and a ceiling of nearly 50,000 feet. Powered with a single de Havilland Goblin jet engine, which also powered the original Lockheed jet fighter, the P-80 Shooting Star, the Vampire is of all-metal construction and has arresting gear for carrier landings retracting into the exhaust jet cowling.

Another very successful British jet plane, the twin-engined Gloster Meteor, was the only Allied jet fighter to see action in the war, but except for the fact that its speed is in the 500-mile-an-hour class, performance data are still restricted.

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