SCIENCE NEWS

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GEOLOGICAL PAPERS AT MINNEAPOLIS

FLOWAGE marks on laboratory samples of steel closely resembling certain markings in folded rock structures were described at the meeting of the Geological Society of America by Dr. A. Nadai, of the Westinghouse Company. Slip surfaces, formed in laboratory samples of steel when it is put under enough pressure, closely resemble the great faults or breaks in bedrock, that are geological features of some parts of the country. Dr. Nadai's researches show that laboratory samples of even the strongest alloy steels creep indefinitely under pressure if sufficiently hot. From these experiments, geologists may be able to determine what happens to rocks at great depths when deformation occurs.

RECRYSTALLIZATION of rock components, and the "lining up" of the newly formed crystals as the rocks are folded may be important factors in the production of zones of weakness in these rocks, according to Dr. C. O. Swanson, of the University of British Columbia.

REPEATED deformation of the Sierra Nevada region, studied by Dr. Evans B. Mayo, of Goldfield, Nev., whose researches were supported by the U. S. Geological Survey, resulted in a series of structures of various ages. Where ancient structures intersected, great intrusions of molten rocks occurred. Later, during the ice ages, great volcanoes burst forth at the intersections of the younger structures.

RIGIDITY acquired by rocks when they recrystallize under pressure may be an important factor in structural evolution, was pointed out by Drs. Paul Billingsley, Burton, Wash., and Augustus Locke, of San Francisco, consulting mining geologists. They found that as rocks under stress recrystallize they become more rigid, until eventually they resist further deformation, so that stresses must be relieved elsewhere by deformation.

STUDIES of deformation of the rocks of most regions are extremely complex, because each deformation is influenced by the "leftover effects" of all previous deformations, and tends to destroy some of the evidence of these earlier deformations. This is not true in the Philippine Islands, according to Dr. Edward H. Wisser, of San Francisco, who finds that only one deformation has occurred in the region since it was formed. Beginning at a time shortly after the building of the Rocky Mountains, shallow water sediments were deposited continuously until late in Miocene time (day before yesterday, geologically speaking). Then the region was compressed, so that to-day it is folded into ridges having a north-south trend, with the structures all clearly due to a single major deformation. With east-west compression, a north-south elongation of the folded sediments, which were in places more than three miles thick, is called for by theory. Dr. Wisser's field studies show that this elongation is actually present, and confirm the theory which was derived from studies of more involved structures.

COLOR motion pictures, already used to illustrate medical and biological research reports, are useful in geological work, according to Dr. Chester R. Longwell, Yale University geologist. Dr. Longwell photographed the great Muddy Mountain and Keystone overthrust faults, in southern Nevada, where dark-colored ancient rocks have been pushed over bright-colored rocks of later age. Relations of the various rock beds in this near-desert region were strikingly shown by the color film.

WINTER WHEAT

DROUGHT, which has gripped the major crop areas of the country since late summer with hardly a let-up, has created a serious situation for the growers of winter wheat. Yet the danger of an actual shortage, or even the necessity for higher prices on flour and bread, is still remote, according to figures of the Bureau of Agricultural Economics, U. S. Department of Agriculture.

The present "wheat year" began on July 1, 1939, with a carry-over of 254 million bushels. To this was added a crop of 755 million bushels, making a total stock of 1,009 million bushels. After deducting domestic consumption and export (before the recent stopping of export subsidies) the carry-over anticipated for July 1, 1940, is 304 million bushels.

Winter wheat is expected to show a short crop because of the drought, but when there is a reduction in winter wheat there is always an increase in the acreage of spring wheat planted. The Bureau of Agricultural Economics expects this increase to amount to as much as 10 per cent. in the spring of 1940, and estimates a wheat crop of 600 million bushels—a decline of 155 million bushels under the 755 million of last year. This will bring the total stock at the beginning of the 1940 "wheat year" to 904 million bushels. The bureau anticipates a decline in domestic demand and in exports (if any) down to about 660 million bushels, which will leave a carry-over of 241 million bushels as of July 1, 1941.

The one thing that could cause a serious upset in the calculations would be a continuation of the present drought through the rest of this winter and into next spring and summer, damaging the spring wheat crop as severely as the winter wheat has already been harmed. However, no dependable system of forecasting thus far devised undertakes to peer that far into the future.

The crop weather of the year just closed was certainly full of surprises. At the outset of the growing season a severe spring drought covered most of the country, and Secretary Wallace appointed a special drought committee to deal with the situation. Then, in late May and June, heavy rains fell, and the drought committee rejoiced to find itself superfluous. The rains lasted until the summer-growing crops were well made. Then, about August 20, they stopped, and the drought that started at the summer's end is with us still in the middle of the winter.

Greatest distress is anticipated among winter wheat farmers in the West. Over wide areas they had nothing but dust in which to sow their seed. The first serious cold wave of the winter, coming with the beginning of the new year, failed to damage the diminished crop because of a providential light snow that covered most of it. However, neither this nor later snows will suffice to produce a full crop, for the plants simply are not there. The country must depend on normal spring rains and a normal spring wheat sowing to make good the losses in the winter wheat regions.

HIGH BLOOD PRESSURE

THE extract of healthy kidneys will bring back from the point of death patients suffering from high blood pressure, it has been discovered by Dr. Arthur Grollman, of the Johns Hopkins University School of Medicine, and Drs. Tinsley R. Harrison and John R. Williams, Jr., of Vanderbilt University School of Medicine. The extract may be to patients with high blood pressure what liver is to the anemic. Physicians are enthusiastic over this promise of a new life-saver for thousands of sufferers from high blood pressure, killer of more men and women than any other disease. Even cancer, tuberculosis and syphilis are not so destructive of human life as is this condition known to physicians as hypertension.

Tried first on rats, the kidney extract brought the blood pressure of those with hypertension down to normal. On normal rats, however, there was no lowering of blood pressure, and no toxic or other objectionable effects were observed even when the dose was set at four times that taken by the rats with hypertension. In rats in which the kidney had been cut off to produce experimental hypertension, the extract has another effect. These animals, for whom the high blood pressure was evidently a necessary condition for life, fell into a state of apathy, vomiting, staggering and finally died.

The extract is not yet ready for use as a medicine until further research and testing has been made. About twelve human cases ranging in age from 36 to 60 years have already received the treatment and have been brought out of a state of coma bordering on death when the blood pressure was brought down to a normal level.

If you are suffering from high blood pressure, don't bother to make yourself kidney stew. Eating kidneys won't lower your blood pressure, Dr. Grollman explained, because a ravenous appetite would be needed to eat the quantity of whole kidneys necessary for the medicinal effect and cooking would destroy the medicinal value. The extract is not difficult to take by mouth; in alcohol it is said to be quite palatable.

Apparently very similar in action to the extract used by Dr. Grollman and his associates is another substance reported for the same purpose by Dr. Irvine H. Page, of the Lilly Laboratory for Clinical Research of the Indianapolis City Hospital.

Renin, a substance contained in the kidney, Dr. Page has found, reacts with a substance in the blood to produce a third substance christened angiotonin. When either renin or angiotonin is injected into the blood stream, an inhibitor is liberated, and such an inhibitor also has its origin in the kidney. These serve to counteract renin and prevent or cure hypertension.—MARJORIE VAN DE WATER.

A NATIONAL NEUROPSYCHIATRIC INSTITUTE

SURGEON-GENERAL THOMAS PARRAN, of the U. S. Public Health Service, proposes in his annual report, transmitted to Congress on January 6, to establish a National Neuropsychiatric Institute. This institute would be modeled after the National Cancer Institute, where a staff of trained investigators are searching for knowledge leading to methods of controlling cancer.

Mental and nervous diseases and epilepsy together represent the largest unsolved problem in medicine according to the report. Hospitals caring for mental disease have on their books more than 500,000 patients, and more than 117,000 additional patients are in hospitals for mental defectives and epileptics. The aging of our population will tremendously increase the total number of sufferers from mental disease.

Surgeon-General Parran pointed out that by 1980 it is predicted that we shall have only half the people under nineteen years of age that we have now and twice as many over the age of sixty-five years. The incidence of mental disease in the age group over sixty-five years is ten times what it is in the group of nineteen years and under. A little mathematics will show how much more mental disease we shall have then than now. We must start now to work out methods for preventing mental disease to help avoid such a load in the future.

"Recent developments showing the influence of certain vitamins, such as nicotinic acid, in relieving cases of insanity not heretofore recognized as being of dietary origin open many possibilities for further research not only of accessory food factors but of other phases of body metabolism, such as hormones. The impression is growing among psychiatrists that constitutional and metabolic factors may play a rôle in forms of insanity heretofore thought of as being of psychic origin." The effects of insulin shock treatment now used in one form of mental disease, schizophrenia, which are like "taking the veil from the patient's eyes, transporting him from a vegetative state to an apparently normal one for a time," cause a great disturbance of body metabolism. All these factors indicate the need for physiological research on mental and nervous disorders.

The proposed Neuropsychiatric Institute would be built on the present site of the New York Marine Hospital, giving the staff access to patients and to the library facilities of the metropolis, and the advantages of working under the "stimulating influence of extensive activities and informed personnel in the nervous and mental disease field." The plans call for 350,000 cubic feet of laboratory space for fundamental research and access to 200 patients for clinical study. It is also suggested that the institute should have funds to allot to competent groups throughout the country for research on the problem of nervous and mental disease and epilepsy, and that a national advisory council, similar to the National Advisory Cancer Council, should be established.—JANE STAFFORD.

A NATIONAL AIRPLANE ENGINE RESEARCH LABORATORY

CONSTRUCTION of a national airplane engine research laboratory is urgently recommended in the twenty-fifth annual report of the National Advisory Committee for Aeronautics, made public on January 8.

Through a sub-committee, whose chairman was Colonel Charles A. Lindbergh, it is found "that there is a serious lack of engine research facilities in the United States, and that it is of the utmost importance for the development of aviation in general, and for our defense program in particular, to take immediate steps to remedy this deficiency."

Emphasizing this suggestion, the National Advisory Committee for Aeronautics, through its new chairman, Dr. Vannevar Bush, president of Carnegie Institution of Washington, continued: "The reason for foreign leadership in certain important types of military aircraft is due in part to the superiority of foreign liquid-cooled engines. At the present time, American facilities for research on aircraft power plants are inadequate and can not be compared with the facilities for research in other major fields of aviation."

While the committee did not cite specific examples of foreign planes in the "leadership" class, it is believed that Messerschmidt fighters, Heinkel pursuit-fighters and Junkers and Heinkel bombers—all of which are powered with liquid-cooled engines—would be typical planes of the class to which the committee referred.

Aircraft design and research will ultimately replace the Atlantic and Pacific Oceans as the best bulwark for the defense of the United States, according to the report. Pointing out that the nation is most fortunately situated between two great oceans, it reads: "However, as advances in aeronautical science result in increased range of aircraft the significance of these oceans will gradually diminish and superiority in aircraft design will become more and more essential to our national safety."

The most significant event of the year, for the future of American aviation, was the authorization of a second major research laboratory to be established at Moffett Field, Calif., some thirty-eight miles south of San Francisco.

Further details of what has become known as the "500-mile-an-hour wing" for airplanes were also described in the new report. Research scientists at the Langley Field, Va., laboratory have discovered "a new principle of wing design in which the transition from smooth (laminar) flow to turbulent air flow over a wing was so delayed as to reduce . . . basic air resistance by approximately two thirds. So far the application (of this achievement) is limited to small airplanes, but there are indications of its ultimate applicability to larger airplanes through continued research."

ITEMS

WAR in Europe is interfering with weather reporting in the North Pacific area. The U. S. Weather Bureau reports increased difficulty in making good weather maps for the benefit of vessels in waters off the northern Pacific coast of the United States, as well as for areas ashore in the Pacific Northwest. Reason is the total radio silence of ships of British, Canadian and other Empire registry all over the world, as well as greatly reduced communication even from Japanese, Norwegian and other neutral shipping. Weather data radioed from such ships formerly supplied basis for far wider and more accurate reporting and forecasting of marine and coastal weather than is now possible. Only American ships are still untrammeled sources of meteorological data at sea.

ONE of the most active sun-spot groups for nearly a year, swiftly growing and easily visible to the eye through smoked glasses, has ushered in the year 1940, according to astronomers at the U. S. Naval Observatory. First sighted as a solitary sun-spot on December 31, with an area of only a quarter of a square degree, the group has grown actively each day. On January 4 it contained forty spots and had a size of twenty-eight square degrees, more than a hundred times its original area. There is a distinct possibility that the new year's sun-spot inauguration will disturb, or even disrupt, transatlantic short-wave radio communication. Scientists have discovered that the activity of a sun-spot group—its speed of growth—is frequently associated with radio "blackouts." So if you have a short-wave receiver that fails to bring in Berlin or London in the next few days don't blame the set too much. Perhaps it will be caused by 1940's first big sun-spot outburst.

HINT of a coming epidemic of influenza appears in reports to the U. S. Public Health Service. The number of cases has been steadily increasing ever since October and during December ran from 1,000 to 5,000 cases higher per week than during the five-year median for the same period. For the week ending December 30 there were 4,836 cases reported, but two states, among them South Carolina, which has had the highest figures, have not yet reported. The week of December 16, there were 6,455 cases reported throughout the nation, 2,353 of them in South Carolina. The number fell during the week of December 23, and dropped still lower during the week of December 30, but incomplete reporting during the holidays may account for this.

SLOW neutrons from the atom-smashing cyclotron, of the kind used in the spectacular splitting of the uranium atom, are five times as effective against cancer as the fast neutrons which are already showing promise as anti-cancer weapons, is announced at the University of California. The new, slow-neutron attack on cancer is far from the stage of being used in treatment of human cancer sufferers. It was developed in test-tube experiments with cancer tissue removed from the body by Dr. P. G. Kruger, of the University of Illinois, now working with the cyclotron at the University of California. In the new process, fast neutrons coming from the cyclotron are slowed down by passing through a thick block of paraffin. These slow neutrons then enter a test-tube containing cancer cells in a solution of boric acid. The boron atoms of the boric acid capture neutrons which break down the boron into helium and lithium. These fly off and lose their energy in the malignant or cancer tissue and in so doing, destroy its malignancy.