enlarged—of the earth's surface motion in two dimensions. The record obtained shows the motion of the earth's surface as it might be seen through a stationary microscope suspended in space. This record makes it possible for seismologists to determine at a glance the kind of movement in a seismic wave instead of going through a laborious and seldom undertaken point-by-point computation by comparison of records.

A third new installation at Palomar—a tripartite seismograph—will indicate accurately and more quickly the direction from which earthquake waves and the faint microseismic waves arrive at the station. The latter vibrations (microseisms) are recorded when the globe is earthquake-free and the earth's crust is considerd to be at rest. They seem to be associated with the motion of the sea and, in fact, increases in microseismic intensity sometimes make it possible to locate a storm at sea.

Science News Letter, January 19, 1952

GEOLOGY

Yellowstone Geyser Erupts After 60 Years

➤ MOST IMPORTANT event of 1951 concerning geysers is the eruption, for the first time in nearly 60 years, of Splendid Geyser in Yellowstone National Park.

Since 1892, when it became dormant, there has been no proved natural eruption of this geyser. Since 1892 the nearby geyser, Daisy, has been erupting frequently and with considerable regularity at intervals of approximately one every hour and 40 minutes. Since then, Daisy has played about 4,500 times each year, during all of which time until this year the Splendid lay quiet.

Old Faithful continued to put on its regular performance, but fewer people were observed watching the show. The fence that has been erected to protect the geyser from too-curious visitors during the winter season is leaving scars in the base of Old Faithful's cone, and park naturalists are searching for some other way of protecting the geyser.

During 1951, 74 of the named hot springs were observed in eruption while 45 unnamed geysers were seen playing. A few of the major geysers were unusually active during the year. Besides the usual and dependable performers, such as Old Faithful, other geysers that put on a regularly good show were Splendid, Giant, Mastiff and Catfish.

The rejuvenation of the Splendid, after it long quiet period when naturalists had thought it dead and Daisy the successor, is aiding the understanding of geysers' activities. It has helped to show, in a spectacular manner, that there is an exchange of function between geysers which are connected underground. George D. Marler, park naturalist, states that the length of time between this exchange is not only indefinite, but long.

Science News Letter, January 19, 1952

MEDICINE

Virus Disease Barrier

Body tissue may contain a sterilizing barrier to the progress of infection. Barrier consists of jelly-like mass holding tissue together.

➤ EXISTENCE IN the body tissues of "a sterilizing barrier to the progress of infection" by disease viruses is suggested in experiments by Drs. F. and M. L. Duran-Reynals of Yale University School of Medicine in New Haven, Conn.

The barrier consists of a jelly-like mass which holds tissues together and which scientists call the ground substance.

Hyaluronic acid, an important chemical component of this ground substance, can inactivate cowpox virus, the Yale scientists have discovered. This ground substance chemical can also inactivate the virus of Russian encephalitis virus, Dr. Alice E. Moore of Sloan-Kettering Institute, New York, found, thus confirming the results of the Yale scientists.

Several of the conditions and phenomena observed in the Yale experiments "duplicate what takes place" during virus infection in animals, the scientists point out. For one thing, the concentration of hyaluronic acid they used was about the same as its assumed concentration in the ground substance of several tissues.

When they added hyaluronidase, the "spreading" chemical that breaks down hyaluronic acid, the inactivating effect on the virus of the acid was brought to a maximum.

In their experiments, the virus was grown in a culture medium containing cells. The acid inactivated the virus in the fluid surrounding the cells but not the virus in the cells. This corresponds to the generally recognized fact that viruses which get inside cells in the body are protected against injurious agents.

The investigation should be expanded, the scientists caution, before the suggestion of the findings is taken as a conclusion. But if the results do in any way duplicate what happens in the body during infection, it could be assumed that hyaluronic acid and perhaps other similar chemicals of the ground substance act to inactivate viruses. This would make the ground substance a sterilizing as well as a mechanical barrier to the progress of germs in the body.

Details of the experiments are reported in the journal SCIENCE (Jan. 11).

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BIOCHEMISTRY

Anti-Malarial Synthetic

New, potentially powerful man-made remedy for malaria perfected from hydrangeas and an ancient Chinese medicinal plant related to hydrangea.

➤ HYDRANGEAS THAT bloom at Easter, an ancient Chinese medicinal plant related to the hydrangea, and a team of scientists at Lederle Laboratories have given the world a new, potentially powerful synthetic remedy for malaria.

The new synthetic drug, pending registration of a tradename, is being called Ch'ang Shan. This is the name of the plant the Chinese used 3,000 years ago as a remedy for malaria. The two are not identical, since the synthetic drug has been modified to make it less toxic than the anti-malaria chemical found in the Chinese plant.

Tests on laboratory animals show the new drug to be 80 to 100 times more effective than quinine, the cinchona tree chemical used as a malaria remedy in the western world for centuries. Lederle scientists are hopeful that clinical tests on human subjects, now under way, will show it to be better than other synthetic antimalarials. Results of these tests, however, are not yet ready for reporting.

The scientists at Lederle who developed the new drug are: Dr. Benjamin Duggar, Frank Ablondi, Dr. Brian Hutchings, Dr. R. B. Baker, Dr. Reginald Hewitt and Wyeth Williams, working under the direction of Dr. J. H. Williams.

Work on this drug started more than five years ago. It was stimulated by the shortage of quinine during World War II. Ch'ang Shan roots from China were also in short supply, so the first step was to find a related plant that might yield an antimalarial chemical. This was found in the Easter variety of hydrangea from certain greenhouses. Chemical analysis of the hydrangea chemical gave an empirical formula of $C_{16}H_{19}N_{303}$. Further work led to the structure and synthesis of the new drug.

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