

MEDICINE

# Immunity to Encephalitis Achieved in Mice

Protection Given Animals For at Least Five Weeks By Death-Dealing Injection Not Yet Extended to Humans

**A** METHOD of giving protection against encephalitis, popularly called "sleeping sickness" and recently epidemic in St. Louis, was reported by Drs. Leslie T. Webster and George L. Fite of the Rockefeller Institute for Medical Research to the American Association of Pathologists and Bacteriologists meeting in Toronto. During last year's St. Louis epidemic, physicians had no method of protection against the disease.

The method made mice resistant to the disease within seven days. So far no results on human cases have been reported, but the research seems to be a step in that direction.

The discovery of the protective method depended on the previous discovery of these scientists that the causative virus of the disease, like the infantile paralysis virus, invades the body through the nose, travelling to the brain along the nerves of smell rather than via the blood stream.

Protective resistance to the disease or immunity, to use the scientific term, may be established by injecting a small amount of the causative virus into some other part of the body than the nose, whence it will travel along a route relatively insensitive to the infection, Drs. Webster and Fite found.

They injected 1,000 death-dealing or lethal doses of the virus under the skin or into the abdomen of mice. The animals did not get encephalitis but remained well. Within seven days they were immune to 1,000 intranasal or 1,000,000 intracerebral lethal doses. In fact, a single injection of one millionth of a gram of the virus brings about this high grade immunity, they reported. The immunity lasts five weeks and doubtless much longer.

These investigators also developed a test which distinguishes the virus that caused the disease in the St. Louis epidemic from other types of the disease. They reported that the type prevalent in St. Louis last summer also occurred in Kansas City, Mo., and New York City in the summer of 1933 and in Pa-

ris, Ill., in 1932. It was not the same type, serologically, as that which broke out in Japan some years ago, nor is it the same as the type known as epidemic or lethargic encephalitis. It was from this latter type that the disease acquired its popular name of sleeping or sleepy sickness.

*Science News Letter, April 7, 1934*

ARCHAEOLOGY

## World War Trenches Reveal Ancient Battle Lines

**R**OMAN emperors and modern World War generals both had the same ideas as to where to place battle lines, archaeologists have discovered.

An expedition from the Fogg Art Museum of Harvard, led by Dr. Vladimir J. Fewkes, has spent several months exploring World War trenches and shell holes in Yugoslavia. Results of the expedition, just announced at Cam-

CHEMISTRY

## Yes, There's Gold in the Sea; But Just Try to Get it Out

**T**HE CRY "Gold!" which stirs emotions mightily has been raised as a sequel to the successful extraction of the chemical, bromine, from sea water by a chemical plant at Wilmington, N. C., which swallows a third of a billion pounds of sea water daily and snatches bromine out of it in exchange for cheaper and more plentiful chlorine.

That there is gold in the sea there is no doubt. But the difficulty is to extract it profitably.

The most serious gold rush to the sea occurred in the years following the World War when the chemist, Fritz Haber, saw a chance of making Father Neptune give up gold with which to

bridge, Mass., show that a single site was sometimes used for fortifications by early Macedonians, then Roman legions, then armies of the Byzantine Empire, soldiers of the Old Serbian kingdom, Turks, modern Serbians, and finally World War troops.

A string of Roman forts built by the Emperor Trajan in the second century A.D. was one discovery. The forts, inferred from Roman sources, but never identified, are today a series of mounds south of the Danube. For 150 years, ten Roman legions were stationed in these Danube forts from Bavaria to the Black Sea. A Roman military road was also discovered.

Roman sites are present throughout this region and the rest of Old Serbia, and especially Macedonia, it is reported. Some of the emperors were natives of what is now Yugoslavia, and large and important cities of Roman times are today being identified, some at the sites of modern cities.

Other discoveries of the expedition included a mound in Macedonia containing relics of New Stone Age habitation. Painted pottery discovered there shows cultural relations with the Aegean coast, and is believed to be the most northern extension of that culture yet known. The newly found site may help in determining routes by which later civilizations were to spread. Five unclothed female figurines of baked clay used as religious objects by the Stone Age people of 3000 B.C. were found.

*Science News Letter, April 7, 1934*

pay the reparations which the Allies were trying to extract from Germany. This great chemist was the father of Germany's poison war gases but he found scientific refuge in England from the Nazi regime just a few months before his death early this year.

Haber checked carefully the gold contents of sea water reported by other scientists. Their estimates were that the sea contained on the average about a tenth of a grain of gold per ton of water. So Haber made artificial gold-containing sea water and found that he could recover the gold with the right kinds of precipitating agent, filter and coagulation. Since 1890 many had tried

and failed but Haber had every reason to hope for success.

So he put out to sea in a ship specifically fitted as a chemical factory. He got samples from the oceans of the world. The results were all disheartening. The seas contained only a thousandth of the gold that previous analyses had indicated. Inaccurate analytical methods and use of gold-containing chemicals in making the earlier analyses had led Haber on a wild gold chase. Haber found the average gold value of sea water to be only 24 hundredth thousandths of a grain per gross ton.

Disappointedly he wrote: "It is not probable that the precipitation of gold from sea water will ever be a commercial success."

*Science News Letter, April 7, 1934*

#### PSYCHOLOGY

### Same Chord Produces Calm and Excitement

**T**HE MUSICAL chord known to musically trained persons as the "chord of excitement" and more technically as the "diminished seventh chord," need not always produce a feeling of excitement in the listener, Dr. Christian Paul Heinlein, of the Florida State College for Women told the Southern Society for Philosophy and Psychology.

The chord is fitted admirably for exciting passages and this use is illustrated clearly in the music of Liszt, Wagner, and Tschaiikowsky, but the chord is extremely versatile, Dr. Heinlein said. He presented musical passages in which the chord is conducive of calm and repose.

*Science News Letter, April 7, 1934*

#### ASTRONOMY-METEOROLOGY

## Weather Cycles on Planets Revealed by Brightness Study

### Colossal Examination of Records Since 1840 Shows Up Variations That German Astronomer Believes Atmospheric

**O**THER planets in the solar system have their cycles of weather. Such is the conclusion arrived at by Dr. Wilhelm Becker of the Astrophysical Observatory at Potsdam from a long study of planetary light.

He collected all the observations that have been made on the brightness of the planets Mars, Jupiter, Saturn, and Neptune, from 1840 down to the present time, eliminated the effects of their varying distances from us and from the sun, reduced all the observations to a common scale and standard position of the planet—a colossal piece of work. When this was done, he found that there were still variations in brightness that could not be accounted for by any external cause, but must be due to changes that take place on the planet itself.

These changes, Dr. Becker believes, are atmospheric. They are comparable to the weather cycles that have been observed on the earth, such as the well-established Brückner cycle of 35 years. This cycle cannot be connected with sunspots because its period would then be 11 or some multiple of 11 years.

Dr. Becker's reasons for arriving at this conclusion are:

Some of the planetary variations in brightness found by him recur at equal intervals of time—are regularly periodic. Others, though irregular in period, have always the same character at each recurrence. The maxima and minima of brightness occur at different times on the different planets, and therefore can not be due to a single external cause such as a variation in the intensity or quality of the sun's radiation, which would affect all at the same time. Finally and most important, he finds that the brightness variations are correlated with certain changes in the appearance of the planet that can be and have been observed with the telescope.

Dr. Becker gives the following picture of the observational results in the scientific journal *Forschungen und Fortschritte* and in his report to the Prussian Academy of Sciences:

The brightness variations of Mars are characterized by long-lasting minima and short sharp maxima, the variation in the intensity of the light coming to us being about 35 per cent. There is no regular period.

Saturn, on the other hand, shows variations that are the mirror image of those of Mars. They have long-lasting



A PLANET CHANGES EXPRESSION

The differences between these two photographs of Mars which were taken about a month apart indicate how the appearance of the planet changes. The polar caps change conspicuously, being largest in Martian winter and smallest in summer. The general surface of the planet is reddish with sharply bounded areas of gray or dull green. It has an atmosphere, though not a dense one. The pictures were taken at the Mount Wilson Observatory of the Carnegie Institution of Washington with the 60-in. telescope.