SCIENCE NEWS

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DISEASE LIKE ROCKY MOUNTAIN FEVER IN THE EAST

EVIDENCE that dangerous Rocky Mountain spotted fever, or a disease very like it, occurs in states of the eastern seaboard as well as in the West, has been reported by Drs. R. E. Dyer, L. F. Badger and A. S. Rumreich, of the U. S. Public Health Service. The mystery of a number of cases of a strange and sometimes fatal disease which had occurred in these states during the last summer was simultaneously cleared up.

Rocky Mountain spotted fever is caused by a virus which gets into the blood by the bite of a tick. The first symptoms are chills and general discomfort. The fever may run as high as 107 degrees Fahrenheit. On or after the fourth day an eruption or spotty rash appears which is dark red and may become purplish. Pains in the bones, muscles, head and neck, and delirium are other symptoms. The disease lasts for several weeks. In some localities it is highly fatal. A protective serum has been developed by Dr. R. R. Spencer, of the U. S. Public Health Service.

In April, 1930, Dr. Dyer and colleagues began investigating cases of typhus fever which had been reported in some numbers from southeastern states. They soon found that there were actually two diseases, one typhus and one a similar disease which they believe is Rocky Mountain spotted fever. At least, the second disease can not be distinguished from Rocky Mountain spotted fever clinically.

They found that patients who had typhus lived in cities or towns, while the spotted fever patients, with only one exception, lived in the country. Most of the typhus patients had been in close association with rats and many remembered being bitten by fleas, probable typhus carriers, shortly before they became ill. Half of the spotted fever group had been bitten by ticks and the rest had lived under conditions in which tick bite was possible. The spotted fever cases, moreover, occurred at times which corresponded with the tick season, whereas the typhus cases were scattered throughout the year. No deaths occurred in the typhus group, but in the Rocky Mountain spotted fever group there were seven.

Dr. Dyer and his colleagues followed up the circumstantial evidence they had gathered in their field investigations. From blood of some of the spotted fever patients a virus was established which resembles closely the virus of Rocky Mountain spotted fever. One of the most conclusive bits of evidence was the immunity test. Animals and men that have had spotted fever once do not get it again, but are immune to it. The investigators found that animals that had recovered from Rocky Mountain spotted fever were immune to the strain isolated from the unknown disease of the southeast. Conversely, animals recovered from the unknown disease were immune to Rocky Mountain spotted fever.

Proof that this new disease in the southeast is Rocky Mountain spotted fever seems positive, but the investigators of the U. S. Public Health Service refrain from saying as yet, and call the new disease "an infection of the Rocky Mountain spotted fever type."

Until recently, Rocky Mountain spotted fever was believed to be confined to the Bitter Root Valley in Montana, where the wood tick that carries it is extremely prevalent. It is in this valley, also, that the disease is most often fatal. However, it has spread to Colorado, Idaho, Utah, Oregon, Nebraska, Wyoming, California, South Dakota, Washington and British Columbia.

In the East, the cases of endemic typhus investigated occurred in Baltimore, Savannah, Tampa and in smaller communities in Georgia and Florida. The Rocky Mountain spotted fever type cases occurred or originated in rural communities in Delaware, Maryland, Pennsylvania, Virginia, North Carolina and the District of Columbia.

THE RETIREMENT OF SENATOR RANSDELL

RETIREMENT from the Senate with the end of the present session of Senator Joseph B. Ransdell, Democrat, of Louisiana, marks a loss to science not easily compensated.

Senator Ransdell has been active in sponsoring many public health measures, most notable of which have been the establishment of the National Leprosarium at Carville, Louisiana, and the National Institute of Health now operating under the direction of the U. S. Public Health Service. In this institute, scholarships may be given to research workers in order that they may pursue research work in cancer, the common cold and other diseases, the control of which is of vast importance to mankind.

Senator Ransdell also introduced and pushed legislation which was recently enacted establishing a national hydraulic laboratory at the U. S. Bureau of Standards; and it was an amendment which he offered to a pending agricultural appropriation bill which first gave the U. S. Bureau of Plant Industry the means to work for the eradication of the pink bollworm. Flood control legislation has long been another subject upon which he has labored.

In his farewell speech to the Senate last week, Senator Ransdell chose for his theme: The Conservation of Public Health—the Most Important Problem Confronting Mankind.

Calling attention to the establishment of the National Institute of Health, Senator Ransdell said: "I can not suggest to the philanthropists of America, many of whom are seeking some wise use for their wealth, anything better than to contribute generously to this institute for the purpose of combating disease. Large sums are needed to place the institute on the solid foundation required for the colossal tasks ahead of it, and while Congress can be relied upon to do its part, the demands

on the Federal Treasury are so heavy that I fear long delay for its full development unless private donors come to its relief.'' The Chemical Foundation Incorporated has made one contribution, and another one has been received from C. P. Wilder, of Worcester, Massachusetts.

Senator Ransdell's work was lauded at the close of his speech, by Senators Hatfield, of West Virginia, and Copeland, of New York, both physicians. Senator Copeland said that the United States lagged behind eight or nine other countries in the control of disease. The New York Senator also declared that every one should read particularly that portion of Senator Ransdell's speech which points out that any increased span of life now enjoyed in this country is due to the elimination of many childhood diseases, whereas men of mature years face prospects of death from disease exactly as menacing as those with which we were confronted fifty years ago.

MUSICAL CHORDS FROM ATOMIC VIBRATIONS

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THE musical vibrations of alcohol, water and gasoline and other common chemical substances have been written and played on the piano, by Dr. Donald H. Andrews, of the Johns Hopkins University.

The seductive chord of alcohol, for instance, is not the product of Dr. Andrews's imagination but represents accurately the various vibrations occurring among the atoms of the alcohol molecule and found in the Raman spectrum of its light. Thus the transposed music of the atoms can now be heard directly.

Of the substances tried up to this point, alcohol is first favorite with most listeners. Actually, with the exception of one note the seven notes of the alcohol chord form a well known harmonic combination. The tones of the chord may, of course, be broken up to give a melody or theme.

Interesting cooperations between the laboratory and the concert hall will result from this simple but provocative suggestion. Composers have already asked for the scores of these chemical themes. A chemical opera, said Dr. Andrews, can now be written in which the chemical chords can be used, ''Christmas night'' perfume will herald the heroine, arsenic the villain, water the coming rain.

On the other hand, the chemist with an interest in music will soon be looking more closely into his favorite songs and symphonies. Perhaps the stirring war song is a transposition of adrenalin—the substance that pours into the blood when he gets angry.

It looks as if some jazz orchestras had come near to imitating the melody of gasoline—for the gasoline music is a discordant combination of many unrelated notes. A similar effect might be produced by sitting abruptly on the piano.

Wood alcohol, in spite of its close chemical relationship to grain alcohol, has a harsh, sharp sound. Water is mysterious, pleasant without being sugary, like the murmur of a waterfall in a deep glade. This music is derived from the light of these substances.

Light rays change color on passing through a substance. The amount of the change, discovered two years ago by Sir Chandrasekhara V. Raman, 1930 Nobel prizeman in physics, has been used by him and other scientists to measure the molecular vibrations.

Millions on millions more vibrations are made each second by the chemical substance than human ears can hear. However, Dr. Andrews has for the first time transposed the chemical music on to the piano, with these interesting results.

VELOCITY OF A NEBULA

ELEVEN thousand miles per second is the new record ''apparent'' velocity reported detected in the reddened light from a distant ''island universe'' viewed through the world's largest telescope on Mount Wilson.

The faint nebula discovered to seemingly recede from earth at this tremendous speed is so far distant that light traveling six trillion miles a year would need 120 million years to reach earth.

This new research result is said by Dr. John C. Merriam, president of the Carnegie Institution of Washington, to be ''of special interest at this time because of Einstein's visit and the bearing that it will have on his conception of the universe.'' Dr. Walter S. Adams, director of the Carnegie Institution's Mount Wilson Observatory, reported the discovery to Dr. Merriam who announced it.

Milton L. Humason in photographing with the great hundred-inch telescope the spectrum of the faintest nebula yet observed, discovered by a fellow astronomer, William H. Christie, observed that its spectrum lines were shifted to the red in such a way that a rushing away at eleven thousand miles a second would be necessary to produce it. This is sixty per cent. greater than any so-called apparent velocity so far observed.

But astronomers do not actually believe that the far distant cluster of stars is receding into space at any such tremendous velocity. They see the true explanation in the curvature of space, as postulated by Professor Albert Einstein, now at Pasadena, working with the astronomers who made the discovery. Space, he says, is curved in dimensions higher than the three familiar in everyday experience, just as a ball is curved in three dimensions. Very distant objects, like the nebula just discovered, give effects of great speed not because they are moving rapidly but because they are so distant that space gets a chance to produce its effects.

THE CRYSTALS OF THE URAL MOUNTAINS

LARGE ice crystals, up to eighteen inches across, can be found at only one spot in the world, at the famous Kungur ice-caves of the Ural Mountains.

Creeping its way along the chill subterranean passages, the expedition of the Hydrological Institute of Leningrad, led by Dr. W. Altberg and W. Troschin, gasped at the fantastic structures taken by water in these remote

grottos. They returned with a priceless set of photographs to share their amazement with the scientific world.

Snowflakes, seen under the microscope as beautiful, delicate six-pointed crystals of very varied designs, will nevertheless not bear comparison with these strange Russian formations. Hailstones on very rare occasions have been found to consist of larger crystals, visible without magnification.

The cave crystals are not compact and solid. They are hollow, and six-angled, with a curious, spiral geometry. They show the intricate tropical forest effects of window-pane frost projected into three dimensions.

The odds against the coincidence of unusual physical circumstances necessary for the growth of large crystals to visible size are said to be enormous. Only at one other place on the earth's surface have they been reported and there not permanently.

The ice is deposited like hoarfrost by the cooling of moist air as it passes outwards through the caves. Those of the weird caves, so far explored, 22 in number, stretch in a nearly straight line for a distance of a kilometer. Measurements by the hydrological group showed that with a temperature outside of 40 degrees below zero the entrance to the first grotto, which contains much ice, was at 3 degrees Fahrenheit. The temperature rose steadily as the party passed inwards through the successive caverns, reaching as high as 45 degrees Fahrenheit above zero in the innermost cave. Under certain conditions a current of air passes from warmer to colder grottos, thus setting up the conditions for the deposition of ice.

The information obtained by the Leningrad party throws new light on the mode of formation of ice crystals and on the origin of ice caves.

THE POWELL MOUND

(By Science Service)

PREHISTORIC America had its periods of building activity, and perhaps, in between, its periods of depression. Evidence that no less than six different times Indians of this region organized their efforts to work on the great Powell Mound is the latest discovery made by archeologists who are now excavating the base of the ancient earthen monument at East St. Louis.

Examination of the site indicates that there was no very long gap of inactivity between the building of the six successive stages of the mound, according to a statement made to *Science Service* by Dr. A. R. Kelly, director of Illinois Archeological Explorations. The mound is definitely prehistoric and may well be at least one thousand years old, he said.

The Powell Mound, which is part of the famous Cahokia group of Indian mounds, is proving a strategic site for scientists who are writing America's pre-history. Explorations so far offer convincing assurance that Indians of Cahokia were linked culturally with Florida and the Gulf of Mexico to the south and also to the north with Wisconsin, Dr. Kelly said.

So significant are the contents of the mound considered that Dr. W. C. McKern, of the Milwaukee Public Museum, has come to East St. Louis to observe the excavations. He finds a marked similarity between the Indians here, as shown by their mound and its contents, and the mound-building Indians of Aztalan, in Wisconsin.

A link with the south is found in two species of shells in the Cahokia burials. These shells are from the Gulf of Mexico. Copper-covered wooden objects shaped like spindles and believed to be either ornaments or game pieces have been found in Powell Mound, and these are almost exactly like objects found in a Florida mound twenty-five years ago, it is recalled. To what extent the contacts of different Indian groups were by trade or migrations is not fully understood at present.

ITEMS

SUN-SPOTS decorate the sun in large numbers according to reports to *Science Service* from the Mount Wilson Observatory. On Thursday, February 26, there were 32 spots arranged in seven groups, while the day before there were 40 spots in six groups. Visitors to the National Academy of Sciences building, in Washington, were able to see many small spots spread over the image of the sun as projected within the rotunda of that building.

THE world's largest meteorite yet discovered is reported found by a Johannesburg land surveyor in the Tanganyika region of Africa. This record import from space consists of a mass of iron and nickel weighing some 70 to 80 tons and measuring nearly fourteen feet long. Its discoverer, W. H. Nott, staked a mining claim in order to obtain legal title to his discovery. The meteorite was found in open country about half way between Lake Nyasa and Lake Tanganyika. The newly discovered meteorite, which undoubtedly fell to earth many years ago, will probably exceed in size the meteorite that was found in the northeastern part of southwest Africa in 1928. This mass was then considered to be the largest actually discovered.

THE rubber planters of the Dutch East Indies, with profits depressed by the present low price of rubber, are seeking to recoup by extracting oil from seeds of the Para rubber tree. An item in the German scientific journal *Die Umschau* states that rubber-seed oil has in considerable measure the drying properties that make linseed oil valuable, and that it can compete to advantage with linseed oil, because it is at present about 20 to 25 per cent. cheaper. It is used in the manufacture of paint, linoleum and soap. Hevea, the Para rubber tree, is a botanical cousin of the castor bean, whose seed has long been a source of a widely used oil. Rubber-seed oilcake can not be used for cattle feed because it is poisonous. The planters therefore burn it under their boilers. Gathering the seed for pressing in the Dutch East Indies is made practicable through the low labor costs.