tion of Dr. LeRoy Abrams, professor of botany at Stanford University. With this information, the railroad's physicians were able to make accurate diagnoses and give specific treatments for each patient.

The results of this method of attacking the problem show, Dr. Matzger declared, that seasonal hay fever and asthma are preventable diseases.

Guinea Pig Studies

Hope that better methods of treating asthma may be developed appeared in the announcement by Dr. Bret Ratner of New York University College of Medicine that he had been able to induce asthma in guinea pigs.

This means that now for the first time asthma can be studied in the lower animals with dry dust antigens, which are comparable to the substances that produce asthma in humans. By this method, Dr. Ratner said, it will be possible to study various measures for the alleviation or eradication of this very frequent and incapacitating malady.

The guinea pigs were placed in a special experimental chamber containing asthma-causing dusts and after a certain period of time became sensitized to the dusts, so that at any time afterwards when they breathed these dusts, they had typical asthmatic attacks, just as a man sensitive to dust gets an asthma attack from breathing this dust.

In the early stages of becoming sensitized to dusts, many of the guinea pigs show the effects only in their noses and throats, but as sensitization goes on other organs are involved. This compares with early signs of allergy in children, Dr. Ratner pointed out, in whom repeated attacks of sneezing and so-called colds, which are actually allergic in character, later on become more widespread and these same children develop true allergy.

Deformities of Teeth

Deformities of teeth and jaws and a serious form of bronchial disease, bronchiectasis, are among the conditions now ascribed to hay fever, asthma or other allergic conditions.

The new idea of bronchiectasis being due to an allergy makes it possible not only to treat this condition successfully but even to prevent it, Drs. Samuel H. Watson and Charles S. Kibler of Tucson, Ariz., pointed out. This disease, in which one or more bronchi are dilated, is characterized by a bad breath, paroxysms of coughing and expectoration of pus and mucus.

The Tucson physicians believe that 90 per cent. of the bronchiectasis they see occurs in allergic persons and that the bronchiectasis and its accompanying sinusitis are secondary to allergic bronchitis and rhinitis—asthma and hay fever to you. If the allergic condition can be diagnosed and treated early, these doctors believe the bronchiectasis and sinusitis can be prevented.

Any dentist will tell you that mouth-breathing may pull the dental arch out of shape. Drs. T. Wingate Todd, Milton B. Cohen and B. Holly Broadbent—the latter a dentist—of Cleveland, told the allergists that marked deformity of the jaws is most often seen in children who have had active allergy of the hay fever or asthma type in very early life.

Perhaps mouth-breathing on account of the asthma or hay fever played a part. The Cleveland doctors pointed out, however, that any disturbance in the orderly progress or growth of the face can cause malformations of the jaw. Disturbances leading to such deformity may be caused by well recognized ailments but they may also be caused by mild, frequently unrecognized disorders, for example a case of hay fever so mild that it just seems as if the child were always having a slight head cold.

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PHYSICS—GEOLOGY

Lead Atoms May Yield Clues To Very Old Earth's History

Further Study of Variation of Isotopes May Show That Ordinary Type of Metal Holds Chemical History

THE METAL lead, already used in scientific estimates of the age of the earth, may also yield important clues to the earth's history back farther than ever before into the ages following the earth's birth from the sun, recent experiments at Harvard University indicate.

Studies made by Dr. Alfred O. Nier, national research fellow in the Harvard physics laboratories, indicate that atoms of the metal may hold locked within them at least a partial record of chemical and physical developments when the earth was young.

His studies concern the ordinary variety of lead. A second type of lead, derived as the end product of the decomposition of uranium, a radioactive element, has already won wide fame as a measure of the earth's age.

Essentially Dr. Nier's discovery is that the relative proportions of the isotopes of this metal, ordinary lead, vary considerably from sample to sample. Isotopes are atoms of the same element which differ in weight. Ordinary lead, for example, has four isotopes, weighing 204, 206, 207, and 208 atomic units. According to Dr. Nier's experiments, the relative abundance of these isotopes may vary as much as 15 per cent. Scientists have heretofore believed that the isotopes of lead had a certain, fixed ratio.

This peculiar isotope distribution dates back millions of years and was probably caused, the Harvard scientist believes, by the early contamination of ordinary lead in its primitive forms by the lead formed from the radioactive elements, thorium and uranium.

Further study of this variation and its significance may indicate that the ordinary lead atom carries within it a partial record of physical and chemical developments when the earth was young. They also expect to secure important new clues to the mechanism of the formation of lead ores.

Key instrument in the research is a special mass spectrometer, believed to be the most delicate "atom sifter" known to science. Not only can the apparatus detect the presence of rare isotopic forms, heretofore a fairly difficult procedure, but it can also yield the most accurate measurements ever made of the abundance of different isotopes present in an element.

Dr. Nier has also studied 16 other elements as the start of a comprehensive research program which will eventually put every one of the ninety-odd known elements through his spectrometer. His studies are also providing a check on the use of the other type of lead in the "radioactive clock" estimates of the earth's age.

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