

is a factor predisposing to rheumatic infection," but adds that the results of his research justify going further in studies of the apparent relation between the two conditions.

Of course, it may be months or years before the discovery can be applied to human beings. Many additional laboratory and field investigations need to be conducted, Dr. Stimson says. Nevertheless he has obtained the following positive and "encouraging" results:

Guinea pigs were given scurvy by withholding vitamin C from their diet. They were then inoculated with hemolytic streptococci, "germs" thought to play

a role in causing rheumatic heart disease. The animals developed heart lesions "somewhat comparable" to the most typical lesion of rheumatic disease found in man. Guinea pigs fed on diets lacking other vitamins but not lacking vitamin C did not develop these typical lesions after inoculating with the streptococci.

That is the story so far. When it is finished, vitamin C-containing fruits and vegetables or the vitamin itself, now made in the laboratory, may be able to play a conspicuous part in reducing deaths from heart disease.

*Science News Letter, December 8, 1934*

ably, could be formed in the two steps outlined, eight of the eleven most prevalent constituents of stony meteors are accounted for.

Concluding his report, Prof. Lewis states "It has been my purpose, not to erect any complete cosmological theory which would state the origin of the disintegrating rays, or where or when the material represented by the metallic meteors has been converted into the material represented by the stony meteors, but rather to present the very strong evidence for a genetic relationship between these two kinds of material, and to consider the various processes by which the genesis may have occurred."

*Science News Letter, December 8, 1934*

#### CHEMISTRY

## Elements in Earth's Crust Caused by Cosmic Rays

### New Hypothesis Suggests That Bombardment For Eons Of Time May Have Formed Them From Iron and Nickel

**P**ENETRATING cosmic rays striking the earth for eons of time may have caused the formation of the varied elements, found in the top few miles of crust, from the supposed iron and nickel core. This is the suggestion of Prof. Gilbert N. Lewis, of the University of California.

Prof. Lewis' theory, entitled "The Genesis of the Elements," appears in the *Physical Review* (Nov. 15). Prof. Lewis is world-famous among chemists for his researches, among them the development, with Dr. Irving Langmuir, Nobel Prizeman, of the so-called Lewis-Langmuir atomic theory.

In summarizing his hypothesis, Prof. Lewis reports:

"The hypothesis is suggested that a great part of the matter in the universe is composed chiefly of iron and nickel, like the metallic meteors, and that such material which is thermodynamically stable with respect to all spontaneous transmutation, except at extremely high temperatures, is superficially attacked by cosmic radiation to produce the material represented by the earth's crust and by the stony meteors."

The metallic meteors consist of more than 99 per cent. iron and nickel, while the stony meteors are much less dense and are more like the rock of the earth's crust.

"It occurred to me," continued Prof.

Lewis, "that if the crust of the earth, and especially if the stony meteors, are representative of the material produced by the disintegration of the primal substance of the metallic meteors, then there should be discernible some immediate genetic relationship between the abundance of the main atomic species of the stony meteors and of the metallic meteors."

Prof. Lewis has found striking agreement in his search for such relationships.

The analysis of metallic, iron, meteors reveals that over 99 per cent. of the mass present consists of two isotopes of iron and two isotopes of nickel. If cosmic rays had energies sufficient to split these iron and nickel atoms in half, two atoms of silicon would be formed for every atom of the twice-as-heavy iron and nickel atoms. Next to oxygen, silicon is the most prevalent element found in the earth's crust, and comprises more than a fourth of the mass of the crust.

In turn, suggests Prof. Lewis, the various isotopes of silicon might be disintegrated by cosmic rays to form magnesium and helium. Magnesium occurs widely, in combination, throughout the earth's crust in great abundance.

Counting three isotopes each of silicon and magnesium together with aluminum and sodium which, conceiv-

#### ARCHAEOLOGY

## Empire of Trebizond Is Rediscovered

**R**E-WRITING history keeps scholars busy these days.

Last year, a Yale professor produced a learned volume showing that historians have overlooked a whole empire of the ancient world, a very powerful empire centered in Arabia.

Now, a University of Wisconsin professor returns from research in Europe to report that he is restoring a medieval empire to a place of importance in the world's story.

Losing whole empires out of history seems incredible. Yet, for four hundred years, the Empire of Trebizond has been so nearly forgotten that medieval specialists were about the only ones familiar with its name. Not even a recognized historical document survived from this empire. There were only casual references in Byzantine volumes. Trebizond looked almost unimportant.

Recently, however, Russian and English archaeologists have unearthed evidence giving Trebizond greater significance as a center of civilization. And Prof. Alexander A. Vasiliev of the University of Wisconsin, who has long been attracted by references to this neglected empire, determined to make a new search for its story.

Early this year, he was granted leave of absence to see what he could find in the manuscript crypts of European and Near Eastern museums, in the catacombs of monasteries and mosques, and the rare book vaults of foreign libraries. Discoveries from his research will appear in book form.

Trebizond began its existence as a