pexata, Eupagurus pollicaris, Ostrea virginiana and *Cancer irroratus.*

The significance of this unique occurrence of zinc in the economy of *Sycotypus* and *Fulgur* is still to be determined, as is the nature of the combination in which it exists. These points, together with the distribution of the element in other marine forms about the sound, are at present being investigated and will be reported upon later.

HAROLD C. BRADLEY.
SHEFFIELD LABORATORY OF PHYSIOLOGICAL CHEMISTRY, YALE UNIVERSITY.

ATMOSPHERIC NITROGEN FOR FERTILIZING PURPOSES.

OF much interest to scientific students of agricultural economy is the report of the United States Consul-General Mason, at Berlin, Germany, on a new method of producing nitrogen from the atmosphere for soil fertilization, as announced in the daily 'Consular Report,' No. 1804, issued by the Bureau of Statistics, Department of Commerce and Labor.

The gradual but ultimately inevitable exhaustion of the known nitrate deposits of South America, the report states, lends a growing interest to the methods which have been devised for obtaining a supply of nitrogen for fertilizing purposes from the inexhaustible storehouse of the air. That this can be done as a scientific process has long been known. The first method was by passing a current of air over red-heated copper, whereby the oxygen combined with the metal to form oxide of copper, leaving the nitrogen free. At first the nitrogen thus produced was fixed by combination with calcium carbide to form nitrate of lime (Kalkstickstoff) or calcium cyanimide, a combination of lime carbon and nitrogen, which had all the essential properties of a nitrate fertilizer. But as the use of calcium carbide rendered the product unduly expensive, a method was sought which would employ a substitute for that material, and this was found by Dr. Erlwein, who brought the nitrogen into combination with a mixture of powdered charcoal and lime in an electric furnace. The product of this combination is a black substance containing, besides the lime and carbon, ten to fifteen per cent. of nitrogen, in perfect condition to be used as a fertilizer. From the experiments thus far made with this new artificial nitrate—which is known in commerce as calcium cyanimide—it appears that its nitrogen acts upon plants quite as effectively as that contained in a proportionate quantity of nitrate of potassium or sodium nitrate (Chile saltpeter). The scientific problem of obtaining nitrogen for fertilizing purposes from the atmosphere would seem, therefore, to be satisfactorily solved. Whether it can be done on a very large scale and at a cost which will make it economically available for general agricultural purposes remains to be demonstrated by practical experience.

JOHN FRANKLIN CROWELL.

MISSOURI LEAD AND ZINC REGIONS VISITED BY THE GEOLOGICAL SOCIETY OF AMERICA.

AT the close of the St. Louis meeting of the Geological Society of America, January 2, an excursion to the Missouri lead and zinc regions was given by the Missouri Bureau of Geology and Mines to the members of the society whose work would allow them time for the journey. In the company several universities were represented—Alabama, Dartmouth, Kentucky, McGill, Missouri, Northwestern, Rochester, Springfield and Toronto, and several members of geological surveys were present—Geological Survey of Canada, Missouri, Ontario, West Virginia and the United States. The excursion allowed of a view of the Missouri geological scale from the St. Louis formation (of the sub-Carboniferous), through Devonian, Ordovician, Cambrian to the Algonkian, and many phases of geology, from *peneplain* to paleontology, had their share of attention. However, the chief place in the thought of the visitors was occupied by the mineral resources of the famous lead and zinc localities. A day and a half was spent in the eastern lead region—the classical locality for lead production in the Mississippi valley. A number of mines and mills at Bonne Terre and Central were visited, and the facts obtained there, when combined with those ob-

tained on the visit made during the American Association for the Advancement of Science meetings to the lead pipe works in St. Louis, gave a complete view of the lead industry, from deposits disseminated in the Third Magnesian Limestone to the finished product, to be disseminated eventually throughout the homes and shops of American cities. A dozen mines a score or two miles from the old mine LeMotte, famous in the history of lead mining in the Mississippi valley are being worked by modern methods. Companies of large capitalization are able to mine and mill successfully in a region where the individual could not afford to work, and the annual production is now measured by millions of dollars. At the St. Joe Mine a depth of 350 feet has been reached, and the workings extend about two miles from north to south. One chamber is about 130 feet in length, and furnished ore throughout its entire distance. The mines are in the Bonne Terre or lower division of the Third Magnesian Limestone—a shaly magnesian limestone about 500 feet thick, which rests on Potsdam sandstone, and is overlaid by the Potosi, or upper member of the group. The size and perfection of the concentrating and milling plants were a surprise to the visitors. Two mills were visited, each of which has a daily capacity of 1,500 tons.

Some of the party took a side excursion to Pilot Knob and Iron Mountain. The character of the iron formations reminded the visitors of similar formations in the Lake Superior region.

From the eastern region the company were taken four hundred miles to Joplin and Webb City, where sub-Carboniferous zinc and lead deposits and the treatment of their ores occupied the attention for a day. A few of the eight hundred mines in the region were not visited. The two which were examined gave an idea of the remarkable richness of the region, and explained the prosperous condition of the cities in southwestern Missouri. Picturesque names are not confined to the far west. The 'One Gallus Mine' shows such deposits of sphalerite as to make the most thorough pessimist forget his position. This region is still favorable as a 'poor man's diggings.' With almost no capital, a man can lease a plot of ground and start in to make his fortune. Yet improved methods and well-equipped mills are seen on every hand, and have as a result the addition of several millions of dollars' worth of lead and zinc to the wealth of the country.

The excursionists were shown unlimited hospitality by various organizations in the regions visited, and by five railroad companies, which not only carried the party nearly a thousand miles, but furnished extra engines and held an important train in order that our delayed car could be attached.

The value of the trip was enhanced by the unending courtesy of our 'English-speaking guides,' Drs. Shepard, Wheeler and Buckley, who were ever ready to answer questions and point out facts of interest.

The excursion was due to the enterprise of the state geologist, Dr. Buckley, to whom the visitors are under very pleasant and great obligations for the increased knowledge which they have of the geology of the remarkable lead and zinc deposits of Missouri.

A. R. Crook.

Northwestern University.

SCIENTIFIC NOTES AND NEWS.

The Lalande prize in astronomy has been conferred upon Director W. W. Campbell, of the Lick Observatory, by the Paris Academy of Sciences.

The Gold Medal of the Royal Astronomical Society of London has been conferred upon Professor George E. Hale, director of the Yerkes Observatory, for his researches in solar and stellar physics.

We understand that at its recent meeting the executive committee of the Carnegie Institution adopted the recommendation of the biological committee to establish a Department of Experimental Biology and to call Professor C. B. Davenport, of the University of Chicago, to the charge of it. The work of the department will include at present, among others, a station for Experimental Evolution at Cold Spring Harbor, Long Island, on land granted by the Wawepex Society, and a Tropical Marine Biological Station at the Dry