

a relatively extremely small proportion. It is very probable that many of these widely ranging forms are somewhat local, if that term is not interpreted too narrowly. On the other hand, we should not expect winds to do less for insects, forms inheriting most admirable organs of flight, than for such wingless creatures as spiders. McCook, a well-known authority, states that ballooning spiders have been found more than 200 miles from land and at elevations of more than 1000 feet. He has concluded from a study of distribution in the tropical regions that these spiders may have actually circumnavigated the globe on the wings of the wind. The known distribution of certain small insects in tropical areas likewise suggests that winds may have played a most important part in carrying these minute, fragile insects. In other words, the ability of the organism to support itself in the air appears to be a most important factor in certain types of distribution.

There is very little question but that representatives of many species of insects are carried far beyond any point where they can possibly maintain themselves. Nature is extremely profuse in her provisions for the continuance of both plant and animal life; the greater

the hazard, the more liberal the provision as a rule. It appears reasonable to conclude that winds are carrying millions of insects daily into regions where they cannot possibly survive. A few especially favoured forms may by chance find their way to an area where there are livable conditions. One of the notable instances of this kind was the appearance of a caterpillar on the first crop of tomatoes and peas raised from seed in the out-of-the-way Cocos-Keeling Islands, although it was not a native species, and the parent moth must have travelled hundreds of miles over an inhospitable ocean. A similar case came to the writer's attention recently in connexion with a small patch of corn growing in a Chilean desert. Insects are all about us. Only occasionally do we realise the frequency with which they appear in unexpected places.

Fortunately for man, many of the more destructive species find themselves unable for one reason or another to take advantage of the wings of the wind. An economic application is that insect spread may be somewhat definitely limited by the winds which prevail when other conditions are favourable for dissemination.

### Obituary.

DR. JOHN M. CLARKE.

JOHN MASON CLARKE, who died at Albany, New York, on May 29 last, was one of the foremost palæontologists of America. The son of a schoolmaster at Canandaigua, New York, he was born on April 15, 1857, and received his early education in the school which his father directed. He was inclined in boyhood to the study of geology and natural history, and he proceeded in 1873 to Amherst College, Mass., where he graduated in 1877. At Amherst he came under the influence of the professor of geology, B. K. Emerson, and so entered on his life-work. He began to study in earnest the Upper Devonian rocks and fossils in the neighbourhood of his home, and while holding a succession of small teaching appointments devoted all his leisure to original research.

By the end of 1884 Clarke had made so much progress, that he felt impelled to compare his results with those of European geologists, and he went to spend parts of two years studying under Prof. A. von Koenen in the University of Göttingen. There he graduated with a thesis on Devonian geology in 1885, and after holding another small teaching post, was eventually appointed assistant to Dr. James Hall, the well-known State Palæontologist of New York, in 1886. Thenceforward until his death he was connected with the Geological Survey of New York, becoming State Palæontologist in 1898, and State Geologist as well as Director of the State Museum in 1904.

Clarke's earliest papers on Devonian fossils were published in 1882, and were followed by a long succession which culminated in his two classic volumes, "The Early Devonian History of New York and Eastern North America," published by the Geological Survey of New York in 1908-9. At the same time he studied the Devonian fossils not only of Germany, but also of Brazil, Argentina, and the Falkland Isles. Among his

official duties he was also concerned with several other Palæozoic faunas, and he became the recognised authority on Palæozoic invertebrata in America. With Dr. James Hall he published "An Introduction to the Study of the Genera of Palæozoic Brachiopoda" in 1893-94; and with Dr. Ruedemann a monograph of "The Eurypterida of New York" in 1912. Both these are works of reference of permanent value.

In later years Clarke made good use of his ripe scholarship in considering some of the wider problems of the science to which he had devoted his life. As first president of the Palæontological Society of America, in 1911 he delivered an address on "The Philosophy of Geology and the Order of the State," and in 1921 he published a little memoir entitled "Organic Dependence and Disease." He applied his science to questions of state control, and argued that it pointed to individualism, not socialism, as the essence of progress.

Clarke was an attractive personality with very wide interests beyond those of his special work. As head of the State Museum he also controlled the science division of the department of education, and he was associated with many other organisations in the city of Albany. He will be mourned not only as an eminent man of science, but also as a model citizen.

A. S. W.

MR. D. R. STEUART.

DANIEL RANKIN STEUART, late chief chemist to the Broxburn Oil Co., Ltd., died at his residence, Blackhall, Edinburgh, on August 1. He was a well-known figure in scientific circles in the east of Scotland, and was a recognised authority on the chemistry and technology of shale oil and petroleum. Born at Bogside, Lanarkshire, in 1848, he studied botany and geology in his early youth, and, for reasons of health, spent some ten years in the open-air pursuits of gardening and farming; he received his chemical training at