NATURAL HISTORY NOTES.

Automatic Movements of a Fern.—Dr. Asa Gray, in *Coulter's Gazette*, says: "Mr. E. J. Loomis, of the Nautical Almanac Office, Washington, recently showed me a phenomenon which, I suppose, has never before been noticed, and which is commended to the attention of botanists. A tuft of *Asplenium trichomanes*, gathered last autumn in the mountains of Virginia, is growing in his house, in a glass dish. About two months ago he noticed that one of the fronds—a rather short and erect one which is now showing fructification—made quick movements alternately back and forth, in the plane of the frond, through from 20° to 40°, whenever the vessel was brought from its shaded situation into sunlight or bright daylight. The movement was more extensive and rapid when the frond was younger. When I saw it on the 23d of January, its compass was within 15°, and was about as rapid as that of the leaflets of *Desmodium gyrans*. It was more rapid than the second hand of a watch, but with occasional stops in the course of each half vibration. This was in full daylight next a window, but not in sunshine. No movement had been observed in the other fronds, which were all sterile and reclining, with the exception of a single one which was just unfolding, in which Mr. Loomis thinks he has detected incipient motion of the same kind." This little fern is very common, and it is easy to obtain it and set it growing. The matter is worthy of further investigation.

Vitality of Mollusks.—Very extraordinary statements are found in the books regarding the vitality of shell fish. Dr. Woodward states that in June, 1850, a living pond mussel was sent to Mr. Gray, of the British Museum, from Australia, which had been more than a year out of water. The pond snails (*Ampullariæ*) have been found alive in logs of mahogany from Honduras; and M. Cailland carried some alive from Egypt to Paris packed in sawdust. Indeed, it is not easy to ascertain the limit of their endurance; for Mr. Laidlay, having placed a number in a drawer for this purpose, found them alive after five years, although in the warm climate of Calcutta. In the ordinary land snails such cases are still more remarkable. Some of the large tropical species of *Bulimus*, brought from Valparaiso by Lieut. Graves, revived after being packed, some for thirteen, others for twenty months. Mr. Wollaston had informed Dr. Woodward that specimens of two Madeira snails (*Helix papilio* and *tectiformis*) survived a fast and imprisonment in pill boxes of two years and a half, and that a large number of the small *H. turricola*, brought to England at the same time, were all living after having been inclosed in a dry bag for a year and a half. But the most interesting example of resuscitation occurred to a specimen of the Desert snail from Egypt, chronicled by Dr. Baird in the "Annals of Natural History." This snail was fixed to a tablet in the British Museum on the 25th of March, 1846; and on the 7th of March, 1850, it was observed that he must have come out of his shell in the interval (as the paper had been discolored apparently in his attempt to get away); but finding escape impossible, had again retired, closing his aperture with the usual glistening film. This led to his immersion in tepid water and marvelous recovery. Dr. S. Lockwood, in the *American Naturalist*, for March, adds another remarkable instance of vitality in the case of *Helix aspera*. He says: "August 24, 1878, I ascended an old castle, or square tower, near Queenstown, Ireland, and found between the stones a number of the common garden snail of Europe (*H. aspera*). I secured three specimens, and having wrapped them in paper, put them in my trunk. On my arrival home, October 28, on looking for my treasures, I found that one was crushed. The other two I dipped in water a few seconds, then put them in the fernery, and was delighted to see them crawl about. I could not get them to feed. One died in the following May, having been in confinement nine months. The other died in November, 1879, having lived thirteen months without food.

Recent Botanical Discoveries in America.—Prof. Eaton reports in the *Bulletin of the Torrey Botanical Club*, the discovery in Nova Scotia, by Miss Elizabeth G. Knight, of this city, of *Schizæa pusilla* and *Littorella lacustris*. The rare and interesting little fern, *Schizæa*, was only known before to occur in the pines of New Jersey, although Prof. Gray states that he has seen specimens of it in La Pylaie's herbarium at Paris, collected sixty years ago, and which are ticketed as having been detected in Newfoundland. The *Littorella* was found for the first time in America by Mr. Macoun, in 1869, on an island in Gulf Lake, Canada. It was found again by Mr. Pringle at the northern end of Lake Champlain, a short time only before Miss Knight found it in Nova Scotia; but these are the only records thus far of its discovery in America. Until these discoveries the plant, unlike most aquatics, had apparently a very restricted range of distribution, being confined chiefly to Central and Northern Europe, although not uncommon in many of the lakes and streams of Scotland, and occurring, though rarely, in England.

DUST FIGURES.

BY BURR NOBLE.

I was very much interested in reading the letters in Nos. 5 and 6 of the current volume, SCIENTIFIC AMERICAN, on crystallizations found in telescopic objectives, and was reminded that during ten years' use of surveying instruments I have always noticed this phenomenon in all old instruments which were exposed to very cold weather; I therefore attributed it entirely to freezing.

CURIOUS DUST FIGURES.

This subject has brought to my mind a very peculiar arrangement of dust particles found in a common water pitcher. This vessel was filled with water, and had stood near a window, unused, for about three months, during a portion of the spring and summer, in Kansas. In pouring the water out, my brother noticed the crystallized appearance of the dirt in the bottom, and carefully preserved the sediment and afterward photographed it. At that time (about eight or nine years ago) it attracted a good deal of attention, but none were able to explain the peculiar formation in a satisfactory manner, as no freezing weather occurred during the time the pitcher was standing.

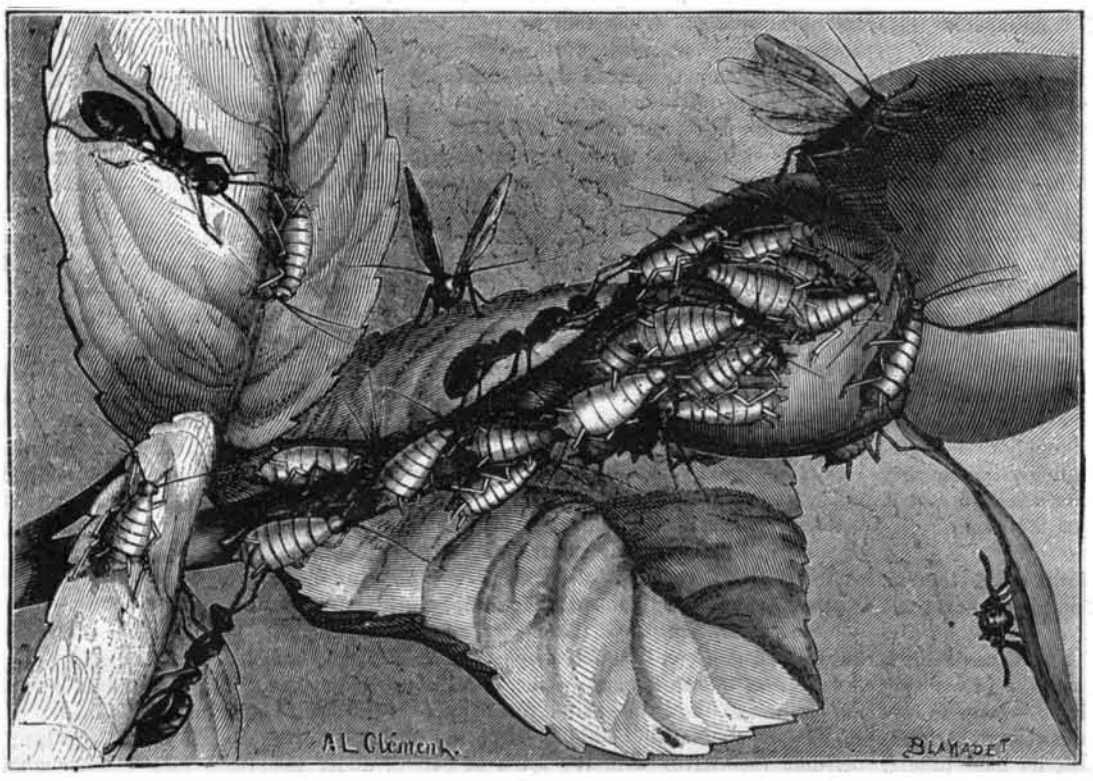
A Many-Named Cereal.

Considerable attention has been called of late to an alleged new cereal, chiefly on account of the notice taken of it by the Kansas Board of Agriculture. Lately the Produce Exchange of this city received from California a specimen of the grain, with a communication with regard to it from an expert in cereals. The letter pronounced the grain no novelty, since it was cultivated in Europe as early as 1596.

It has been in the habit of coming forward every few years under a new name, having already been known successively as Egyptian corn, ivory wheat, Guinea corn, and Indian millet. Each attempt to foist it upon the public has been a clear case of false pretenses. It is really no other than the drooping sorghum (*Sorghum cernuum*), and differs from common sorghum principally in the fact that the stock bearing the head or ear droops. This is not caused by the weight of the ear, as the stalk begins to turn almost from the moment the ear begins to form. It is not rice or anything akin to it, and is not a native of South America. It has been repeatedly tried in all sections of the country, but has never succeeded in obtaining a foothold, because the American farmer will not be induced to accept it as a substitute for wheat, to which it is vastly inferior. Among the semi-barbarous peoples of the East Indies and Africa it forms a staple article of food, owing to the facility with which it can be prepared for the table. Unripe, it is cooked and eaten like green corn. Ripe, it can be boiled the same as rice. Flour is also made from it by crushing. It has abundant foliage of a grayish-green color, and grows to a height of seven feet, and a field of it consequently presents an odd appearance. The writer has nothing to say on the question of its adaptability to dry, arid sections where other cereals cannot grow. The specimen at the Exchange consists of an oblong bunch of grains about six inches long and three to four in diameter. The grains are about the shape of barley, but twice as large, ivory white with a black speck, and almost as hard as corn.

ANTS AND THEIR MILCH CATTLE.

The instincts of the ant are, indisputably, more extraordinary than those of any other in the whole range of animated nature. The ancients magnified them into fabulous miracles. Pliny talks of an Indian ant as big as an Egyptian wolf, of the color of a cat, which entered the bowels of the earth in search of gold, of which they are said to have been plundered during the winter by the human inhabitants of those regions. But exaggeration and credulity apart, the real habits and proceedings of these insects are so extraordinary that they would stagger our belief if not confirmed by the past observations of such naturalists as Huber and Latreille, and those of Sir John Lubbock and others of our own day. One of the most singular traits in their manners and customs is that of keeping and feeding certain other insects, from which they extract a sweet and nutritious liquid, in the same way as we obtain milk from cows. There are two kinds of insects from which the ant tribe abstract this juice—the aphides, or plant lice, and the gall insects Linnæus, and after him other naturalists, have called these insects the milch cattle of the ants; and the term is not inapplicable. In the proper season, any person who may choose to take the trouble to watch their proceedings may see, as Linnæus says, the ants ascending trees that they may milk their cows, the aphides. The substance which is here called milk is a saccharine fluid, which these insects secrete, it is scarcely inferior to honey in sweetness, and issues in limpid drops from the body of the insect, by two little tubes placed one on each side just above the abdomen. (See engraving.) The aphides insert their suckers into the tender bark of a plant, and employ themselves incessantly in absorbing its sap, which, having passed through the digestive system of the insect, is discharged by the organs just mentioned. When no ants happen to be at hand to receive this treasure, the insects eject it to a distance by a jerking motion which at regular intervals they give their bodies. When the ants, however, are in attendance, they carefully watch the emission of the precious liquid, and immediately suck it down. The ants not only consume this fluid when voluntarily ejected by the aphides, but what is still more surprising, they know how to make them yield it at pleasure, or in other words, to milk them. On this occasion the antennæ of the ants discharge the same functions as the fingers of a milk-maid; with these organs, moved very rapidly, they stroke the abdomen of an aphis first on one side and then on the other, and immediately a little drop of the much coveted juice issues forth, which the ant eagerly conveys to its mouth. A single aphis has been known to give it drop by drop successively to a number of ants that were waiting anxiously to receive it. The milk of one aphis having been exhausted, the ant proceeds to treat others in the same manner, until at length perfectly satiated, and with belly swelled almost to bursting, it lazily descends the plant and seeks its nest. A still more singular fact connected with this branch of the natural economy of these insects remains to be stated.



ANTS AND THEIR MILCH CATTLE.

These cows are not always considered the common property of a whole tribe, but, on the contrary, some of them are appropriated to the exclusive use of the inhabitants of a particular hill or nest; and to keep these cows to themselves they exert all their skill and industry. Sometimes the aphides inhabiting the branches of a particular tree, or the stalks of a particular plant, are thus appropriated; and if any vagrant