

Gill at the Cape observatory, and it is hoped that Dr. Elkin will employ it in continuing these remarkable measures. We believe that no method of determining stellar parallax, so accurate and expeditious as this, has ever before been at the command of astronomers.

SIMON NEWCOMB.

CARNIVOROUS HABITS OF THE MUSKRAT.

AT a recent meeting of the Biological society of Washington, a paper was read by Mr. Henry W. Elliott, setting forth an entirely new fact in regard to the diet of the common muskrat (*Fiber zibethicus*), proving that carp-ponds in the west are being completely devastated by this animal. Ponds which should produce many carp are almost entirely barren; and for a long time the owners have been unable to account for it, no hawks being seen, there being no possibility of escape from the ponds, and in some it being impossible for other people to take them with a seine on account of obstructions placed in the way to prevent this. It was finally suggested, and afterwards proved conclusively, that muskrats were the miscreants. Carp have the stupid habit of sticking their noses into the mud during the winter, and hibernating; thus rendering it possible for so clumsy an animal as a muskrat to obtain them easily, — a thing which it would probably do in winter, when roots, etc., its natural food, are hard to obtain. If it be a fact that the muskrat has acquired the habit of eating carp, immense damages are likely to result, unless speedy and extreme measures be taken; for, under these circumstances, such a sluggish and poorly protected fish as the carp can hardly be expected to resist or avoid its enemy, but will become its easy prey: and thus one of the most important works of the fish-commission, from which such great economic benefits were expected, will result in nothing. As a means of getting rid of these pests, so hard to shoot, and not easily trapped, poisoning by means of strychnine placed in apples was suggested as the best, it having been applied with success in many cases. In his communication, Mr. Elliott asserted that in no monograph of the animal could he find any mention of the diet of the muskrat, other than that it was an exclusive vegetarian, and, so far as he could ascertain, this was the first time that the carnivorous appetite had ever been brought before scientific men; in which statement he was sustained by an authority upon mammals, present at the meeting. This was surprising to many; for it seems to be well known, as was proved by the discussion which followed the paper, that the muskrat will, and does frequently, under favorable conditions, eat animal food. One gentleman mentioned that he had seen muskrats take bait, and even live fish, from his hook, while fishing in fresh water. The piles of *Unio* shells frequently seen upon the tops of muskrat mounds, also prove conclusively that it will at times eat animal food. It is noticed that the shells are always perfect, not even having chipped edges; and it would seem strange that this should be so, unless we supposed that they

were left to die before being eaten; the meat then being easily picked out.

The muskrat is not the only rodent which departs occasionally from a vegetable diet; for such animals as the squirrel and capybara are, and have been for a long time, known to eat flesh when the circumstances are favorable. Mice and rats, of course, are well known to be omnivorous, eating animal food as quickly as vegetable, this being the partial result of contact with man. In the other orders of herbivorous mammals, examples of deviations from the normal class of food are frequent, especially under domestication: for example, the feeding of fish to cattle; while, under similar conditions, the carnivorous dog and cat can be made to eat vegetables or vegetable products. By thus adding one more animal to the number of recorded species which will adopt an opposite diet from the natural, Mr. Elliott is deserving of credit; for, notwithstanding the fact that it is known to some, still it has never been placed before the scientific world in any recognized monograph or treatise upon Rodentia.

RALPH S. TARR.

CONDITIONS OF GROWTH OF THE WHEAT-RUST.

THE last part of the journal of the Royal agricultural society of England has sixty pages devoted to a 'Report on wheat-mildew.' Mr. W. C. Little prepared an extended list of questions concerning the wheat-mildew, or wheat-rust (*Puccinia graminis*), to which a large number of answers were received from British farmers who had suffered from the rust. From these reports it is gathered, that the rust is more prevalent in those localities where the atmosphere is most moist. Spring frosts, heavy rainfalls, and violent changes of temperature, encourage rust. Hot weather, with frequent thunder-storms, is most favorable for the rapid development of the fungus parasite. Some of the observations point toward the belief that about eleven days are required for the full development of the *Puccinia* after it has entered the wheat-plant.

Perhaps the most valuable results of the compiled answers are those upon the relation of soils to the rust. The pest is more prevalent on peat and clay soils than on gravel or light lands. Drainage is a partial preventive of rust. High farming encourages the development of rust, especially if the wheat is rank, and it becomes lodged or fallen. There is an agreement of opinion that rust prevails in wheat sown after clover. Newly broken up lowland pastures are seldom sown to wheat because so sure to become rusted.

Dr. J. B. Lawes holds the view that plants are liable to the attacks of parasites, either insects or fungi, in proportion as the soil is deficient in available mineral food. Common tilled land contains about ninety-seven per cent of mineral matter, and three per cent of vegetable substance. The lowlands have this proportion nearly reversed. Dr. Lawes says, "Plants are very much like ourselves; their power to escape disease, and to struggle against