Lake. Some years ago this was a swamp and shallow lake area. Here and there wooded knolls and knobs thirty to forty feet above the general level were islands in the old lake. The filling ranges from a fine gravel to sand and clay with a thick muck soil at the top. Within the last few years a large ditch has been dug through this area and it is now completely drained and bids fair to be one of the finest farming sections of the state. Last spring (1923), when the ditch was being widened and deepened, the dredge threw out parts of the skeleton of a mammoth. These attracted the attention of Mr. McMillan, who brought the upper jaw to the University of Minnesota. Further search was then instituted and this resulted in the recovery of about one fourth of the skeleton. The specimen was found in a stiff blue clay about fifteen feet below the surface with no drift above it. Apparently the skeleton was lying crosswise with the ditch, the tusks being out under the bank. It seems that it had not been disturbed since it sank into the soft muds of the lake and probably the balance of the skeleton is still in place. The portions recovered consist of the upper jaw with an excellent pair of teeth, fragments of the pelvis, one femur, two tibias, tarsals, meta-tarsals, phalanges, one humerus, the larger part of one ulna, various fragmentary ribs, fragments of the cranium and tusk sheaths, vertebrae from the neck, back and tail. Measurements of certain of the skeletal elements indicate an animal about eleven feet high, and the teeth exhibit the usual formula for *Elephas columbi* with seven to seven and one half lamellae to one hundred millimeters.

Most of the previous finds have been of the teeth only and these have been so associated with the drift that it was impossible to determine whether they belonged to the glacial or the post-glacial period. These recent finds seem to indicate that the Columbian elephant survived the glacier in Minnesota and that perhaps we may hope to make other even more important finds as the great muskegs and swamp areas of northern Minnesota are drained.

The following is a list of the elephant remains so far known to have been found within the state:

(1) *Elephas columbi,* a tooth from Rock County, Minnesota.

(2) *Elephas columbi* (?), fragments of vertebrae from Kenyon, Goodhue County, Minnesota.

(3) *Elephas columbi* (?), part of the pelvis found in river gravels eight feet below the surface at Red Wing, Goodhue County, Minnesota.

(4) *Elephas columbi,* a tooth from the river gravels near Red Wing, Goodhue County, Minnesota.

(5) *Mastodon americanus* (?), a vertebra "found in a bed of coarse gravel eight feet below the surface," at Owatonna, Steele County, Minnesota.

(6) *Elephas columbi* (?), a large piece of bone from the drift at Brainerd, Crow Wing County, Minnesota.

(7) *Elephas columbi* (?), a part of a femur labeled an "elephant leg bone from the drift at the site of the M. & St. L. roundhouse, Cedar Lake," Minneapolis, Hennepin County, Minnesota.

(8) *Elephas columbi,* a tooth from Hastings, Dakota County, Minnesota.

(9) *Elephas columbi,* a tooth dredged from the Mississippi River at St. Paul, Minnesota.

(10) *Elephas columbi,* portions of a skeleton from post-glacial lake beds, four miles west of Frost, Faribault County, Minnesota.

(11) *Elephas columbi,* about a fourth of the skeleton, including the upper jaw and teeth, from post-glacial lake beds sixteen miles northeast of Albert Lea, Freeborn County, Minnesota.

(12) *Elephas columbi* (?), base of the skull, showing the occipital condyles, from the drift thirty feet below the surface at Russell, Lyon County, Minnesota.

(13) *Elephas columbi* (?), a tusk, originally four feet long, from the glacial gravels thirty feet below the surface at Farmington, Dakota County, Minnesota.

(14) *Mastodon americanus* (?), a tusk from the superficial deposits (glacial?) at Stillwater, Washington County, Minnesota.

The remains of Pleistocene mammals and of those that immediately succeeded that period are frequently found in the gravels, peat bogs and old lake beds of Minnesota. Among these the Columbian elephant is probably the most common, but no very great attempt has been made to collect those picked up from time to time nor to make a record of the finds as they are reported. But from the number that come in to the university by this casual manner it would seem they must be abundant.

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IS THERE AN ENTOMOGENOUS FUNGUS ATTACKING THE CITRUS RUST MITE IN FLORIDA?

IT has been observed annually since 1912 that the citrus rust mite (*Phyllocoptus oleivorus* Ashm.) reaches the point of maximum infestation some time just after the beginning of the rainy season. This is usually the last of June or very early in July. At this time they are usually present in countless numbers. In some instances a single grapefruit may be infested with more than a half million mites. Shortly after the point of maximum infestation is reached the mites disappear as if by magic, so that by the middle or end of September it is nearly impossible to find a single mite present. In some cases more than an hour of diligent search is required to find a single specimen.

There is considerable evidence to show that this disappearance of the citrus rust mite is due to a fungus disease. In many instances the mites congregate on a small area of the fruit which is in the most

direct sunlight. When so herded together, the area occupied by them becomes yellow and it is impossible to see the rind of the fruit at all. The mites in this mass seem to be stuck to each other like numerous angle worms. They are a writhing, wriggling mass and crawl around without any apparent object or direction. Shortly after this congregating the dead bodies of the mites are observed. They occupy the same spot in the direct sunlight as they did before death. The dead bodies take on a more brownish color than when alive. This congregating habit is contrary to the normal habits of the species. Normally this species seek semi-sunshine or partial shadows and are not found in great abundance on the part of the fruit in direct sunlight. This abnormal habit of congregating has been observed many times since 1920.

It has also been observed that most of the adult mites change color from a lemon yellow to a darker or orange yellow. They also become somewhat sluggish in their movements.

An examination of the dead mites usually shows that certain fungal filaments protrude from their bodies. In most instances, also, there are fungus bodies on the inside of the dead mites. In fact, these bodies have been observed in mites which were still alive but which had changed color and become sluggish in their movements. The presence of these fungus bodies in the living mites indicate that the time is approaching when the species will disappear.

There is an enormous amount of data on file in the Bureau of Entomology which proves beyond the possibility of a doubt that the rust mites always become much more abundant following the use of copper sprays or compounds than they do on unsprayed trees and fruit. They are also abundant a considerable length of time after the beginning of the rainy season when scarcely any mites are present on trees not sprayed with copper sprays. The use of such fungicides evidently eliminates the fungus disease which in all probability under normal conditions would have attacked the rust mites. It seems, according to the circumstantial evidence already obtained, that it is reasonably certain that an entomogenous fungus attacks rust mites in Florida. In all probability this same disease attacks the species wherever the climatic conditions permit.

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PREVENTION OF WEAK LEGS IN EXPERIMENTAL CHICKENS

A DISCUSSION by J. S. Hughes appearing in SCIENCE, February 29, 1924, stated that young chicks often could not be successfully raised in confinement for experimental purposes. He attributes failure to the fact that rickets or "weak legs" develop, due, he thinks, to the absence of direct sunlight. His remedy is to expose the chickens for a few hours each day to sunlight which is not filtered through glass, or to include in their diet cod liver oil, which he has found will prevent the disease.

At present, April 1, 1924, we have in the laboratory 21 chickens which were hatched November 12, 1923. When three days old they were placed in small cages which had been previously sterilized. From that time on they were given no food, grit, water or litter that had not been sterilized. The room in which they were kept was not particularly sunny, and never at any time were they exposed to sunlight that was not filtered through glass windows. Their food consisted chiefly of buttermilk mash, which was always available. When about eight weeks old small amounts of bone meal were mixed with the mash, and raw potatoes were fed to them about twice a week from that time on, the outside of the potatoes being sterilized by immersing them in boiling water. A few carrots were similarly treated, but other than that no vegetables were given. A mixture of fine grains and an abundance of crushed oyster shell and grit composed the remainder of the diet, with the exception of a few dozen hard-boiled eggs, which were fed during the first three months.

None of this lot of chickens has shown any tendency towards the development of "weak legs," although at no time exposed to unfiltered sunlight or furnished cod liver oil. Only a small amount of hard-boiled egg was fed at any time, but the normal development of these chickens may have been to a large extent due to this ingredient in their diet.

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PERMANENT PHOTOGRAPHS

PROFESSOR PEIRCE'S letter in SCIENCE for April 4 (LIX, No. 1527, pp. 318–319) and Dr. Howard's letter for May 9 (LIX, No. 1532, pp. 422–423) have recalled to the writer's mind an experience, the results of which are of interest to any one making a collection of photographs in which the first requirement is permanency of the photographs collected.

In August, 1915, the writer moved from Palo Alto, Calif., to Ithaca, New York. Boxes of freight containing his books, instruments and miscellaneous collection of photographs were routed east by way of Galveston and New York City. At Galveston they were caught on the wharf by the hurricane of August