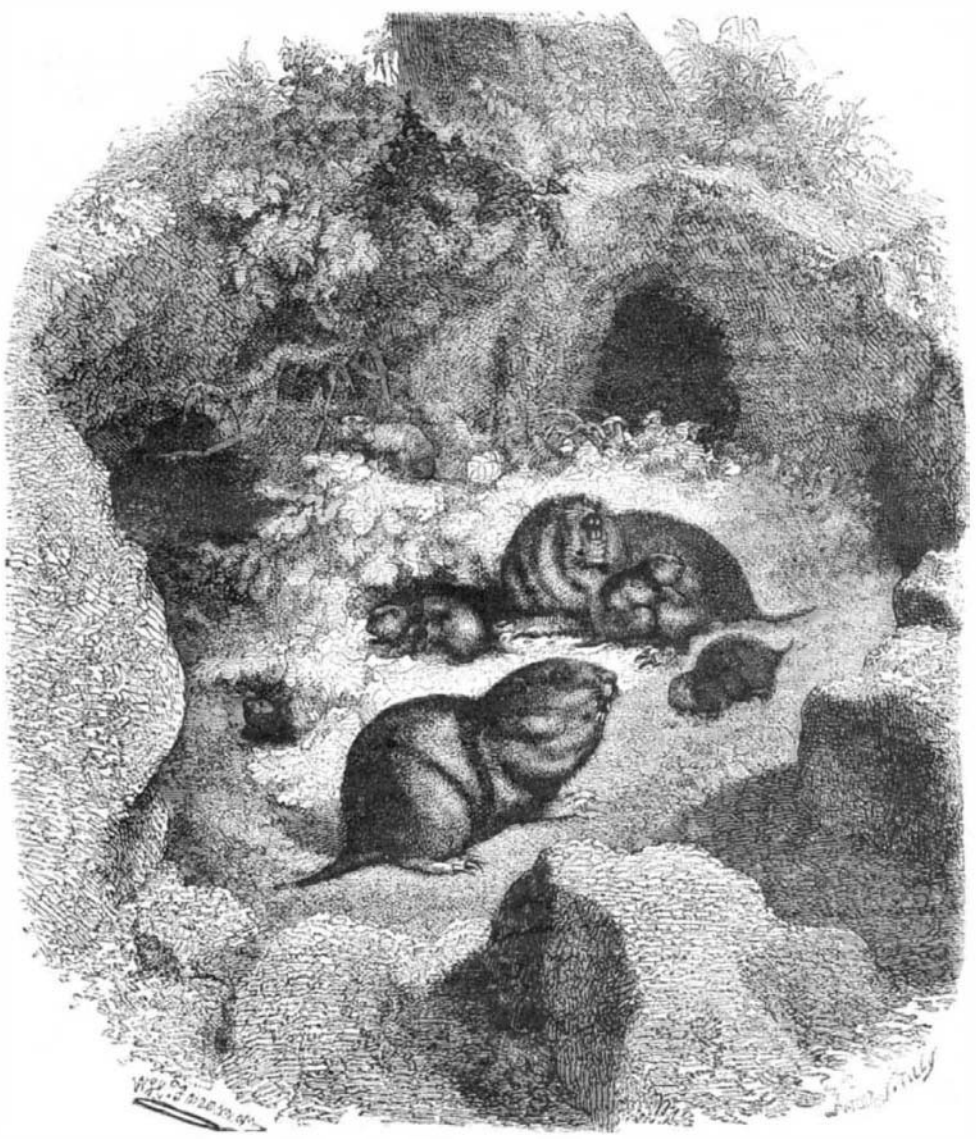
THE POUCHED GOPHER.

The pouched gopher, pocket gopher, or pouched rat (*Geomys bursarius,* Rich.) of the Northwestern States is a small rodent ten to twelve inches long, including the tail. Its color is reddish-brown above, paler beneath, with a plumbous tinge along the vertebral region. This little animal is remarkable for its large head, which is almost as thick as its body, for its large incisors, which project from its mouth, and for its cheek pouches, which are very large, which extend as far back as the shoulders, and are lined with short hair. These pouches are capable of distention, and are used mainly or wholly to convey food into the burrows, to be stored up or eaten at leisure. The animal's paws, which are short, terminate in strong and sharp claws.

The gopher leads a subterranean life, digging burrows in which it remains most of the time. Outside of these excavations are usually seen, here and there, heaps of earth similar to those made by the mole, but which are usually closer together and arranged in a zigzag manner.

From the observations of those who have examined these subterranean galleries made by the gopher, it appears that they first run longitudinally and then meet in one center in common, where they end in several circular galleries, in the midst of which is situated the principal chamber, this being usually at a depth of from three to five feet beneath the surface of the earth. This chamber is capacious, and is lined with soft grass. This is the covert and nest of the animal, in which it remains asleep during a great part of the winter. These little animals scarcely ever leave their retreat except in summer, and then only in fine weather, when they go out to gather food, as well as material to line their dwellings. Their motions above ground are heavy and awkward, and, when they chance to turn over on their back, they have difficulty in regaining their feet. Under ground they move with greater facility, and they burrow as quickly as the mole.

These rodents cause great havoc in planted grounds, since they gnaw off all the roots that come in their way. They have been known to ravage whole fields of tuberous plants. Many attempts have been made to keep gophers in captivity, but they almost always succeed in gnawing through their cages and escaping. Audubon had one which, having got into one of his boots, found it more convenient to gnaw through the toe and get out in that way than to turn about and make its exit through the leg, where it had entered.



THE POUCHED GOPHER.

Firing Torpedoes by Steam.

Some interesting trials lately took place at Westminster with a second-class torpedo boat recently built for the English Government by Messrs. Yarrow & Co., in order to illustrate the new system of steam impulse introduced by them. The arrangement consists in building two troughs inclined at an angle of five degrees in the bow of the boat, which are provided with suitable guides for carrying the Whitehead torpedo. Aft of these troughs or guides are two long steel steam cylinders, 6 inches in diameter and 7 feet stroke, the piston rods of which press against the ends of the torpedoes. Upon steam being admitted into these cylinders, the torpedoes are instautly forced out with considerable velocity, the speed being estimated at about fifteen miles an hour. If, therefore, the impulse is given when the boat is going twenty miles an hour, the total speed of the torpedo upon entering the water is clearly thirty-five miles an hour. The arrangement is exceedingly simple and under the entire control of the steersman.

Hydraulic Silica.

If a solution of potassium or sodium silicate (water glass) is decomposed by an acid, gelatinous silicic acid separates. If this he dried at a red heat, and the operation repeated until the alkaline salts are entirely removed, a pure silicic oxide (silica) is obtained that is insoluble in acids. Landrin says it is the source of the real hardening of hydraulic mortar.

In certain cases the aluminate of lime is a help to the setting of the cement, somewhat as gypsum would be, for, notwithstanding its slow solubility, it renders the combination of the hydraulic substances easier at the first immersion and prevents the rapid entrance of water into the mass of the mortar, which is favorable to the slow and gradual union of the lime with the hydraulic silica. It is a fact, for instance, that the lime from Theil, which contains none of the aluminate, cannot be used for hydraulic constructions in the ocean because it crumbles before it sets, while it has proved very valuable for use in the Mediterranean Sea.—*Compt. Rend.*

NATURAL HISTORY NOTES.

The Largest American Trees.—The largest specimen of wood that has thus far been received by the Central Park Museum is a section of the white ash, which is forty-six inches in diameter and eighty-two years old. The next largest is a section of the *Platanus occidentalis*—a tree known in various sections of the country as sycamore, buttonwood, plane, etc. This section is forty-two inches in diameter and only one hundred and seventy-one years of age.

Vegetable Parasitism in Fishes appears, from recent observations made by Messrs. Olivier and Richet, to be so constant that it may be regarded as normal. These gentlemen examined about 150 fishes taken in the Channel and the Mediterranean, and in all of them they found in the peritoneal liquid, in the lymph, in the blood, and so in all the tissues, microbes more or less numerous, having all the characters of land microbes and being capable of similar reproduction. These organisms were mostly the bacterium called *Bacillus.* The authors cultivated these microbes successfully. They also repeatedly made an experiment which consisted in putting a whole fish or part of it in paraffine melted at 120° or 140°. After solidification, the paraffine was coated with several layers of collodion and Canada balsam. The tissues thus guarded from atmospheric germs all showed, after a few weeks, an extreme development of microbes which were not those of putrefaction. The authors propose to investigate the mode of penetration of these parasites and their influence on the vital functions.

Stamens of Heteranthera.—Fritz Muller communicates to *Nature* some interesting facts with regard to plants which have differently colored anthers or pollen in the same flower, or stamens of different length. Thus in *Heteranthera reniformis* insects visit the short stamens with yellow anthers while fertilization is effected by the longer stamen with pale blue pollen. He suggests that the green color of the anthers of the longer stamens of the mid-styled and shorter styled flowers of *Lythrum salicaria* may protect them against the attacks of pollen-eating insects. In a species of *Cassia* he has noticed that the humble-bees which visit it gather the pollen of the four intermediate stamens, the three upper ones being pollenless, while the three lower ones, which are very long and curved, deposit their pollen on the backs of the insects, whence it is taken by the similarly curved and elongated style.

The Colors of Feathers.—At the close of a valuable paper in the Proceedings of the Zoological Society of London, on the colors of feathers, Dr. H. Gadow sums up his conclusions as follows: We have to distinguish between several categories of colors in feathers: 1. *Objective chemical colors,* directly produced by pigment. To these belong black, brown, red, orange, and yellow. 2. *Objective structural colors.* The feathers may contain no pigment at all, and the color be produced solely by special structural arrangement of the feather substance, for instance, white, and frequently yellow; the latter, if the surface is composed of very fine and narrow longitudinal ridges. Or the feather contains a yellow to brownish black pigment, and the color actually observed, as *green, blue, and violet,* is produced by a specially produced and particularly constructed transparent layer between the pigment and the surface of non-changing colors, *blue* and *violet* are always structurally objective. *Green* seems to be only in a few cases the result of yellow pigment combined with blue surface structure. In most cases it seems to be not a mixture of two colors, but due to yellow pigment light being broken into green. A green pigment seems to be very exceptional. 3. *Colors which change and which entirely depend on the position of the light and eye.* They are produced by a transparent sheath, which acts like a prism. Any changing color represented in the solar spectrum may be thus produced in feathers.—*American Naturalist.*

The Regulative Action of Birds upon Insect Oscillations.—The question, "Do birds sometimes vary their diet so far as to neglect their more usual food, and take extraordinary numbers of those species of insects which, for any reason, become superabundant for a time?" is answered by Professor Forbes (*Bull.,* Ill. State Laboratory) in a very conclusive manner. He selected an orchard which had been for some years badly infested by canker worms; shot a considable number of birds therein for two successive years (54 birds of 24 species the first year, and 92 birds of 31 species the second year), representing nearly all the kinds seen in the orchard; made full notes of the relative abundance of the species; examined carefully the contents of the stomachs obtained, with reference not only to the presence of canker worms, but of all other insects as well; and tabulated the results. The summaries on these tables are brought into comparison with those derived from birds of the same species shot in ordinary situations during the same month. Thirty-six species of birds were taken in the infested orchard; 72 per cent of the species, and 60 per cent of the specimens, had eaten canker worms; 35 per cent of all the food eaten by all the birds was canker worms. The comparisons made between the food of these birds and that of birds shot in other situations show that the large proportion of the food which the canker worms constituted in one case was compensated by a general diminution of the ratios of all the other kinds of food, and not by a neglect of one or two alone. Hence the birds, in checking the increase of the canker worm, were not tending to allow an undue increase of any other species of insect.—*Science.*

The Rose Polytechnic Institute.

Chauncey Rose, a rich bachelor of Terre Haute, Ind., who died a few years ago, provided in his will for a grand school of technology in that city. A splendid edifice and complete workshops were built some time ago, and on March 7 the school was formally opened with a class of twenty-five students selected by competitive examination from forty-five applicants. Charles O. Thompson, eminent in his profession, from Worcester, Mass., is president. The press report of the State remarks: "This event is one of the most important in the history of education in this State, the institution being the first of the kind established in the West. The institution, in addition to the buildings and property, has, according to the *Minnesota Trade Journal,* an endowment fund of near $500,000, left to it by its founder at the time of his death in 1878."

A fair notion of a few of the leading ideas of this new Western enterprise may be obtained from the following extracts from President Thompson's opening address:

"The Almighty makes superintendents and leaders of men—no school can. But the training required for a superintendent must be that of his subordinates. All the best experience of the world sanctions this rule. A superintendent who has not had the training of the shop is as useless as Achilles without his weapons; he may seem and assume to direct and to lead, but he does not. On the other hand, the man who attempts to lead without natural leadership is as useless as the weapons without Achilles."

BARON HAUSSMANN explains the distress of the Parisian cabinetmakers and carpenters as due to the vast importation of ready-made deal furniture, rafters, window frames, lattice blinds, etc., from Norway and Sweden. It is much cheaper to get them made there and transport them to France than to manufacture them in Paris, where wages are very high and the purchasing power of money low. This importation is new. It began after the last universal exhibition, when the building trade was in full activity.