readiness for work. No delay is compelled as in starting fires and getting up steam or in waiting for horses, and immediately the alarm is heard, the attendant can jump upon his engine and start for the fire. In large cities, with their paid fire departments where the steam fire-engines always stand with water hot and steam making, and the horses and crews ready to move out of the house in intervals measured by seconds, this is a matter of less consequence; the engine will seldom fail to start promptly and to have steam ready before reaching its position at the fire. With small places, the case is very different. There, the engine is cold, no crew at hand, the horses often in a detached stable, or even at some distance, and in many cases hand-power only available. In such places, should a source of supply be at hand for charging batteries, the electric automobile fire-engine would prove ideal.

The advance made to date in the production of locomotives for heavy work is illustrated by the completion, recently, for the Atchison road, by the Schenectady Locomotive Works, of a ten-wheel engine weighing 275,000 pounds; while the progress of the business of locomotive construction is evidenced by the acceptance of orders by the Baldwin Works to an aggregate of seven hundred engines of all styles for the year 1902.

The Providence Journal owns an electric automobile, which has been working since the early autumn. It has traversed 1,000 miles and is expected to make the record 1,500 or 1,800 before its batteries will require replacement. The normal output is 22 amperes; but it has risen to 80 when ascending the hill to Brown University from Market Square. It has shown the practicability of rising a 10 per cent. gradient, although at serious cost in life of battery. It is estimated by the *Journal* that the cost is about that of keeping a single horse and carriage.

R. H. T.

BOTANICAL NOTES.

THE 'BROWN DISEASE' OF POTATOES.

For several years the potato crop of Nebraska has been seriously damaged by a disease which causes the fibro-vascular bundles to turn brown. This disease appears to be widely distributed in both America and Europe, but as yet nothing satisfactory has been published in this country concerning the cause of the trouble. About the first of March, 1901, Mr. J. A. Warren, now of the Santee Normal Training School, began a series of experiments in the botanical laboratories of the University of Nebraska in order to determine if possible what produced the disease. He now reports as follows: "My first cultures soon showed tufts of mould filaments projecting from the diseased bundles, and in a few days there were many ripe fruits of *Stysanus stemonites* (Pers.) Corda. I repeated the experiment many times, using both affected and unaffected tubers from different fields. In nearly every case the cultures containing brown bundles produced Stysanus, while those containing no brown bundles produced no Stysanus. Tubers grown at Lincoln, Harvard, Humboldt and Santee, Nebraska, and Cedar, Minnesota, were used, always with the same results. These experiments have now been continued for about eight months, and I hope to follow them the coming season. The results seem to show that *Stysanus stemonites* is the cause of the disease."

The importance of this discovery lies in the fact that this appears to be the first record which connects *Stysanus stemonites* with this disease in this country, as well as the first record of its occurrence.

MORE ON THE PHILIPPINE FLORA.

The Forestry Bureau of the Philippine Islands has issued a sixteen page pamphlet on the 'Tree Species,' giving the scientific and common names, the families and a little information in regard to the usefulness of the trees in the industries. No less than sixty-one families are represented, and the whole number of species enumerated is six hundred and twenty-two. The larger families are Urticaceae, with 45 species; Leguminosae, 42; Euphorbiaceae, 30; Myrtaceae, 28; Rubiaceae, 28; Sapotaceae, 24; and Lauraceae, 22. Of the Cupuliferae there are 13 species, two of which are species of Castanopsis, the remainder being

species of Quercus. There are 18 species of Palms (Palmaceae), and 5 of Coniferae. A solitary species (*Vernonia arborea vestita*) represents the arboreus Compositae of the islands.

A second publication of the same bureau, 'The Spanish Public Land Laws of the Philippine Islands,' is worthy of notice here. This consists of translations and compilations of the principal laws which governed the sale of the public lands in the islands under Spanish rule. It is worthy of mention that the Spanish laws made provision for the reservation of those tracts of land which are denominated 'forest zones,' and of which it is declared that 'the state desires to hold for the commonwealth.' It is further declared in regard to these forest zones that 'no private ownership can be claimed in them by any process of law, unless they are explicitly declared to be salable by competent authority.' One may wish that such wise counsels had prevailed when our forefathers took possession of the forest wealth of this country. Had this been done we should not now be trying to save the last of our forests by the reservation of such mere fragments as have escaped destruction because scarcely worthy of notice by the lumbermen.

ANOTHER TEXT-BOOK OF BOTANY.

A LITTLE book entitled, 'Outlines of Botany,' prepared by R. G. Leavitt, of the Ames Botanical Laboratory at North Easton, Mass., 'at the request of the Botanical Department of Harvard University' is very suggestive of the change which has taken place in our notions as to the proper study of plants in the high schools. Here is a book 'based on Gray's Lessons in Botany,' which is as different from the book of which it is supposed to be a modification as can well be imagined. In fact the preface indicates as much, when it speaks of many schools 'having outgrown certain now antiquated methods of teaching botany.' Instead of a book of lessons to be *memorized,* we have here a book to be *worked through* in the laboratory, with the proper material and appliances at hand. Only one feature of the new book has a familiar look, viz., the illustrations, over which some of us bent thirty-five years ago. All else is new, and to these old-time friends are added many new ones in order to illustrate the new topics and new treatment.

The treatment of the subject may be made out from the headings of the chapters, some of which are as follows: 'Laboratory Studies of Seeds and Seedlings,' 'Laboratory Studies of Buds,' 'Laboratory Studies of the Root,' and so on for the stem, the leaf, the flower, the fruit and the 'Cryptogams.' After each laboratory chapter there follows one of general discussion on the same subject. The closing chapters are devoted to the 'Minute Anatomy of Flowering Plants' and a 'Brief Outline of Vegetable Physiology.' The book is thus an introduction to modern botany, and since it is to be presumed that it has had the oversight of the eminent men in the Department of Botany in Harvard University, we need not be surprised at its excellence, although its author is yet a comparative stranger in botanical circles. We are glad to welcome the book as a valuable addition to the text-books for use in high schools.

INDIAN USES OF PLANTS.

IN a recent bulletin of the Division of Botany of the United States Department of Agriculture, Mr. V. K. Chesnut tells of the uses which the Indians of Mendocino County, California, make of a large number of plants, ranging from red seaweeds, fungi, lichens, ferns and conifers to flowering plants. Fibers, medicines and food constitute the principal uses which the Indians make of the wild plants of the region studied. One is astonished at the large number of fiber plants used by these people, and the question arises after reading this account whether the whites are not allowing valuable native fibers to go to waste. We have probably little to learn from the Indians in regard to the medicinal values of plants, but when we come to the food plants we are again inclined to wonder whether these primitive people may not be able to teach us to make better use of the products of the soil. The number of plants whose seeds yield wholesome food is very much larger than we had supposed possible. One curious feature in the food habits of these Indians is brought to

light, viz., that they eat clover (species of Trifolium), not the flower-heads, as white children do sometimes, but the leaves and stems, quite after the manner of other herbivorous animals! "From the beginning of April along into July it is no uncommon sight to see small groups of Indians wallowing in the clover and eating it by handfuls, or to see an Indian squaw emerging from a patch of clover and carrying a red bandana handkerchief full of the crisp stems."

CHARLES E. BESSEY.

THE UNIVERSITY OF NEBRASKA.

ELIZABETH THOMPSON SCIENCE FUND.

THIS fund, which was established by Mrs. Elizabeth Thompson, of Stamford, Connecticut, 'for the advancement and prosecution of scientific research in its broadest sense,' now amounts to $26,000. As accumulated income will be available November next, the trustees desire to receive applications for appropriations in aid of scientific work. This endowment is not for the benefit of any one department of science, but it is the intention of the trustees to give the preference to those investigations *which cannot otherwise be provided for,* which have for their object the advancement of human knowledge or the benefit of mankind in general, rather than to researches directed to the solution of questions of merely local importance.

Applications for assistance from this fund, in order to receive consideration, *must be accompanied by full information,* especially in regard to the following points:

1. Precise amount required. Applicants are reminded that one dollar ($1.00 or $1) is approximately equivalent to four English shillings, four German Marks, five French francs, or five Italian lire.

2. Exact nature of the investigation proposed.

3. Conditions under which the research is to be prosecuted.

4. Manner in which the appropriation asked for is to be expended.

All applications should reach, before April 1, 1902, the Secretary of the Board of Trustees, Dr. C. S. Minot, Harvard Medical School, Boston, Mass., U. S. A.

It is intended to make new grants in April, 1902.

The trustees are disinclined, for the present, to make any grant to meet ordinary expenses of living or to purchase instruments, such as are found commonly in laboratories. Decided preference will be given to applications for small amounts, and grants exceeding $300 will be made only under very exceptional circumstances.

A list of the grants recently made is given below.

(Signed.)

HENRY P. BOWDITCH, *President.*
CHARLES S. RACKEMANN, *Treasurer.*
JAMES M. CRAFTS.
EDWARD C. PICKERING.
CHARLES-SEDGWICK MINOT, *Secretary.*

1900.

$200, to Dr. H. H. Field, Zürich, Switzerland, to aid in the publication of a card catalogue of biological literature.

$500, to S. H. Scudder, Esq., Cambridge, Mass., for the preparation of an index to North American Orthoptera.

$300, to Professor P. Bachmetjew, Sofia, Bulgaria, for researches on the temperature of insects.

$250, to Dr. E. S. Faust, Strassburg, Germany, for an investigation of the poisonous secretion of the skin of Amphibia.

$250, to Professor Jacques Loeb, Chicago, Ill., for experiments on artificial parthenogenesis.

$650, to the National Academy of Sciences, Washington, D. C., towards the expenses of three delegates to attend the conference of academies at Wiesbaden in October, 1899, to consider the formation of an International Association of Academies.

1901.

$150, to Professor E. W. Scripture, New Haven, Conn., for work in experimental phonetics.

$300, to Professor W. Valentiner, Heidelberg, Germany, for observations on variable stars.

$50, to A. M. Reese, Esq., Baltimore, Md., for investigation of the embryology of the alligator.

1902.

$125, to F. T. Lewis, M.D., Cambridge, Mass., for investigation of the development of the vena cava inferior.