gators' rooms, which, like those in the main building, are fitted with aquaria and supplied with running sea-water. All workers at the laboratory during last summer fully appreciate the advantages gained by this addition.

The library has been considerably enlarged by gifts from numerous friends. Although we were unable to purchase any books, the current subscriptions to journals have been maintained. The following list gives the donations received as far as catalogued: G. Baur, 12 pamphlets; J. N. Coulter, 2 volumes and 2 pamphlets; Stanley Coulter, 2 pamphlets; W. G. Farlow, 2 volumes and 3 pamphlets; C. P. Barnes, J. W. Fewkes, W. F. Ganong, J. S. Kingsley, each 1 pamphlet; Dice McLaren and W. S. Miller, each 1 volume and 1 pamphlet; T. Wesley Mills, 16 pamphlets; C. S. Minot, 15 volumes and 6 pamphlets; Francis Minot, 20 volumes; H. F. Osborn, 7 volumes and 8 pamphlets; A. S. Packard, 9 volumes and 116 pamphlets; Peabody Academy of Sciences, Salem, 5 volumes; Samuel H. Scudder, 1 volume,—a total of 62 volumes and 171 pamphlets. Other gifts were received from A. Agassiz, California Academy of Science, R. Ellsworth Call, C. and R. S. Eigenmann, E. G. Gardiner, Mrs. Gifford, J. E. Ivers, T. H. Morgan, E. S. Morse, W. A. Satchell; but, as these have not returned from Wood's Holl, they have not been catalogued. The most important gift was from Dr. Francis Minot, and included Agassiz's "Contributions" and a series of the publications of the American Academy. The additions go far towards completing our sets of the *American Naturalist* and of the *Botanical Gazette*.

During the former seasons both students and investigators have felt the need of better collecting facilities than the laboratory could offer. Although well supplied with row-boats, the strong tides which prevail in the neighboring waters rendered it imperative for the laboratory to have the use of a steam-launch. Many of the localities where the richest fauna and flora were to be found were beyond the reach of either sail or row boats.

Last spring the trustees supplied this deficiency in the equipment by the purchase of the "Wyandotte," a most excellent launch, designed by Edward Burgess, and in every way suitable to the work. During last summer the "Wyandotte" fully demonstrated her usefulness, dredging and collecting excursions being made every day when the weather was suitable.

Last August the Gifford homestead, which consists of upward of half an acre of land, closely adjoining the lot on which the laboratory stands, and a substantial old house, was advertised at forced sale. The trustees have long believed that in the near future the land and house would be of great value to the laboratory, but have been deterred from purchasing by lack of funds. Appreciating that the amount for which this property could be purchased (thirty-five hundred dollars) was small considering its real value, J. S. Fay, Esq , advanced the money for the purchase, holding a mortgage on the property for three thousand dollars. This generous act secures the property to the laboratory, and at the same time presents the trustees with the sum of five hundred dollars. Since the laboratory was first opened, Mr. Fay has shown by his liberality great interest in its success, and the trustees have once again to thank him most cordially. Their thanks are also due to Professor McDonald, United States commissioner of fisheries, for many courtesies extended by him and his staff to our officers and students.

We are again, as in past years, under obligations to Miss Fay for the use of Gardiner cottage for a mess-room for those working in the laboratory. This last summer the mess was under the immediate charge of one of the officers of the laboratory, and if not in every way satisfactory, yet was on the whole as good as circumstances would allow.

It is hoped that the experience gained will be of service in whatever arrangement may be made another year. The laboratory now owns a complete mess outfit, including tables, chairs, stove, cooking utensils, and table furniture; and it is believed that the house of the newly acquired property can be adapted to a permanent mess-room at small expense.

The trustees believe that the laboratory is now fully equipped; and, until an effort is made to establish a permanent laboratory, but little outlay on improvements will be necessary.

They would, however, again remind the corporation that the success of the laboratory is largely due to the voluntary efforts of the director and his corps of assistants. They have worked faithfully and without further remuneration than their personal expenses while at Wood's Holl. In many cases the work was very arduous, allowing little or no time for study or investigation. It is to be hoped that at least those who give their whole time to the laboratory will in the future receive some compensation.

As the success of the laboratory has greatly exceeded expectation, and warrants the largest hopes for the future, your trustees consider it imperative that an effort be made at once to place the laboratory upon a permanent footing; and they have accordingly voted to take immediate steps to raise sixty thousand dollars, which, when the indebtedness incurred the past season is removed, will yield an annual income sufficient not only to carry it on as heretofore, but to pay a small stipend to those on whose voluntary assistance in direction and instruction we have been dependent for success. The trustees invite your earnest co-operation in securing this amount. The proved usefulness of the laboratory, the great demand for the privileges it offers, and its present far-reaching influence, demonstrate the need for a permanent establishment, and enable us to make our appeal to the public with pride in our brief past, and confidence in our future.

AID TO ASTRONOMICAL RESEARCH.

PROFESSOR EDWARD C. PICKERING of Harvard College Observatory has issued a circular (No. II.) on the above subject. A circular was issued last summer, announcing the gift by Miss Bruce of six thousand dollars for aiding astronomical research. No restrictions were made upon its expenditure which seemed likely to limit its usefulness, and astronomers of all countries were invited to make application for portions of it, and suggestions as to the best method of using it.

Eighty-four replies have been received, says Professor Pickering, and with the advice of the donor the entire sum has been divided so as to aid the following undertakings: Professor W. W. Payne, director of the Carleton College Observatory, for illustrations of the *Sidereal Messenger;* Professor Simon Newcomb, superintendent of the American "Nautical Almanac," for discussion of contact observations of Venus during its transits in 1874 and 1882; Dr. J. Plassmann, Warendorf, for printing observations of meteors and variable stars; Professor H. Bruns, treasurer of the *Astronomische Gesellschaft*, to the *Astronomische Gesellschaft* for the preparation of tables according to Gyldén's method for computing the elements of the asteroids; Professor J. J. Astrand, director of the Observatory, Bergen, Norway, for tables for solving Kepler's problem; Professor J. C. Adams, director of the Cambridge Observatory, England, for a spectroscope for the 27-inch telescope of the Cambridge Observatory; Professor A. Hirsch, secretary of the International Geodetic Association, to send an expedition to the Sandwich Islands to study the annual variation, if any, in latitude; H. H. Turner, Esq , assistant in Greenwich Observatory, for preparing tables for computing star corrections; Professor Edward S. Holden, director of the Lick Observatory, for reduction of meridian observations of Struve stars; Professor Lewis Swift, director of the Warner Observatory, for photographic apparatus for 15-inch telescope; Professor Norman Pogson, director of Madras Observatory, for publication of old observations of variable stars, planets, and asteroids; Dr. Ludwig Struve, astronomer at Dorpat Observatory, for reduction of observations of occultations during the lunar eclipse of Jan. 28, 1888, collected by the Pulkowa Observatory; Dr. David Gill, director of the Observatory of the Cape of Good Hope, (1) for reduction of heliometer observations of asteroids, (2) for apparatus for engraving star-charts of the "Southern Durchmusterung;" Professor A. Safarik, Prague, for a photometer for measuring variable stars; Professor Henry A. Rowland, Johns Hopkins University, for identification of metals in the solar spectrum.

Of the remaining replies, many describe wants no less urgent than those named above. Some relate to meteorology or physics rather than to astronomy, some to work already completed, and others were received too late to be included. Two important

cases may be specially mentioned. In each of them an appropriation of a part of the sum required would have been made; but in one (in our own country) an active and honored friend of the science undertakes the whole, and in the other (in France) the generous M. Bischoffsheim, already known as the founder of the great observatory at Nice, ignoring political boundaries and the comparative selfishness of patriotism, came forward and gave the entire sum required. It is to be hoped that the above named, and other foreign institutions, will obtain more important aid from neighbors when these become aware how highly the work of their scientists is appreciated in this country. The replies not enumerated above are confidential, and cannot be mentioned except by the permission of the writers; but they have placed Professor Pickering in possession of important information regarding the present needs of astronomers. In several cases a skilful astronomer is attached to a college which has no money for astronomical investigation. He has planned for years a research in the hope that some day he may be able to carry it out. A few hundred dollars would enable him to do this, and he offers to give his own time, taken from his hours of rest, if only he can carry out his cherished plans.

Such valuable results could be attained by the expenditure of a few thousand dollars, that no opportunity should be missed to secure this end. Fortunately, the number of persons in the United States able and willing to give liberally to aid astronomy is very large. It is hoped that some of them may be inclined to consider the case here presented. The income derived from a gift of one hundred thousand dollars would provide every year for several cases like those named above. A few thousand dollars would provide immediately for the most important of the cases now requiring aid. The results of such a gift would be very far-reaching, and would be attained without delay. Correspondence is invited with those wishing to aid any department of astronomy, either in large or small sums, by direct gift or by bequest.

HEALTH MATTERS.

Small-Pox Extinct in Ireland.

NOT a single death from small-pox was registered in Ireland last year, says the *Medical Record*. From this scourge, at all events, "the distressful country" appears to be gradually freeing itself. Over the last ten years the average annual number of deaths was a hundred and thirty, but this average is due to the more serious state of things prevailing in the early stages of the decade. Since 1883 there has only been one year in which the number of deaths from small-pox was as high as fourteen. That was in 1887. In 1885 there were but four deaths from small-pox registered in Ireland; in 1886, two; in 1884 there was only one; in 1888 there were three; and, as above stated, in 1889 there was not one.

BOOK-REVIEWS.

Dragon-Flies versus Mosquitoes. Studies in the Life-History of Irritating Insects, their Natural Enemies, and Artificial Checks, by Working Entomologists. With an introduction by ROBERT H. LAMBORN, Ph.D. New York, Appleton. 12°.

THIS neat little volume contains the three prize essays elicited by Dr. Lamborn's circular of July 15, 1889, addressed to the working entomologists of the country. The first prize ($150), as Dr. Lamborn informs us in his introduction, was awarded to Mrs. C. B. Aaron of Philadelphia; the second and third prizes, amounting to $30 and $20 respectively, were divided equally between Mr. A. C. Weeks and Mr. W. Beutenmüller, both of New York. The essays were to treat of the best methods of destroying mosquitoes and house-flies with special regard to the agency of dragon-flies.

Taking into consideration the fact that the essays were to be forwarded at the expiration of eighteen weeks from the time the circular was distributed, the three contributions must certainly be regarded as most creditable to their authors. We believe that Dr. Lamborn, at the time of distributing his circular, could have had no conception of the time required to accomplish any thing of practical or theoretical importance on a difficult entomological question. Large portions of the essays are, as was to be expected, devoted to old and well-established facts in regard to the life-histories, metamorphoses, and morphology of the mosquito, fly, and dragon-fly. These descriptions will be read with interest by all lay readers, whose ignorance of the wonderful life-histories of our most common insects is as glaring as it is inexcusable. But, besides these trite facts, Mrs. Aaron and Mr. Beutenmüller have contributed some points of interest to the specialist. Such are, for instance, Mrs. Aaron's account of her experiments in killing mosquito larvæ and pupæ with petroleum, and Mr. Beutenmüller's carefully prepared preliminary catalogue of the described transformations of the *Odonata* of the world.

Dr. Lamborn's idea of artificially rearing dragon-flies for the purpose of exterminating flies and mosquitoes seems to have met with little favor from the three contributing entomologists. Mr. Weeks concludes that "any attempt to destroy flies and mosquitoes by the artificial propagation of dragon-flies or any other insect would be impossible, unadvisable, and impracticable." Various methods of destruction other than odonat culture are proposed by Mrs. Aaron and Mr. Beutenmüller, such as sprayed petroleum (for the larvæ and pupæ), flushing and grading of land, cultivation of fungoids, the employment of attracting-lamps in the neighborhood of marshes, the rearing of fish and the encouragement of water-fowl where fresh water is abundant. It is to be regretted that the circular did not elicit some work on the distribution and systematic study of our North American *Culicidæ*, a branch of dipterology in which no work of any real value has been done; but this could hardly have been expected from the brief time allotted for competition.

The three essays are followed by a letter on dragon-flies as mosquito hawks on the Western Plains, by Mr. C. N. B. Macauley, and a brief article on the extermination of mosquitoes (reprinted from the *North American Review*, September, 1889), by the well-known arachnologist, Professor H. C. McCook. The work is provided with nine plates, one of which is colored, a useful index, and an extended bibliography to Mrs. Aaron's essay.

Manual Training in Education. By C. M. WOODWARD. (Contemporary Science Series.) New York, Scribner. 12°. $1.25.

THIS book contains an exposition of what manual training is, and also an elaborate and somewhat vehement defence of it. The author is director of the manual-training school of Washington University at St. Louis; and the scheme of manual exercises presented in this book is derived in the main from his own practice. Mr. Woodward, however, is by no means disposed to confine manual training to such special schools, but wants to make it compulsory on all the school-children in the country. His arguments are those with which our readers are already familiar. He advocates manual exercises partly as a means of promoting industrial efficiency and thereby helping the rising generation to earn their daily bread, and partly as a means of intellectual culture. The former argument is much the more effective, and the addition of the latter is by no means an advantage. The plea for manual training on the ground that it promotes intellectual culture is very flimsy, and the sooner it is abandoned the better. The present writer has had more than twenty years of manual training and practice in various branches of work from farming to organ-playing, but not a particle of intellectual benefit has he derived from it. As for the culture of the perceptive faculties, about which so much has been said, that is best obtained by the observation of human nature and human life, which are to most persons the chief objects of interest; and this observation goes on spontaneously without the help of teacher or school. What may be the merits of manual training as a preparation for regular industry, and how far its adoption in the public schools is justifiable on that ground, are questions into which we shall not enter here. That special technical schools like that presided over by Mr. Woodward are useful, there can be no doubt; but the success of such schools composed of picked pupils proves nothing as to the expediency of compulsory manual training for all pupils. Meanwhile those who wish to know what manual training is, and what can be said in its favor, will find this book a help.