Towing-nets.

As to the towing-nets for collecting at the surface, and at depths intermediate between the surface and the bottom, we have but a single noteworthy improvement to mention, — the gravitating-trap of Commander Sigsbee, which was successfully worked on the last dredging-cruise of the steamer Blake. It is designed to traverse rapidly any given vertical space at any required depth, for the purpose of determining the character and abundance of life at different levels. It does not, however, afford the means of obtaining continuous horizontal towings at intermediate depths, unmixed with the life of higher levels; such a result being still a subject for future investigation.

The gravitating-trap (fig. 5) consists of a brass cylinder, two feet long by forty inches in diameter, riveted to a wrought-iron frame, covered with gauze at the upper end, and having a flap-valve opening inward at the lower. It is suspended to the wire dredge-rope on which it travels, by means of a friction-clamp; while at the point below, to which it is to descend, there is a friction-buffer. The weight of the cylinder and its frame, from the manner in which they are suspended, keeps the valve closed until the apparatus has been lowered to the highest level from which it is desired to take the specimen. Every thing being in readiness, a small weight or messenger is sent down the rope, which, on striking the friction-clamp, disengages it, allowing the cylinder-clamp and messenger to descend by their own weight to the buffer. As the cylinder strikes the buffer, the valve closes, and is held in this position, during the hauling-back, by the weight above it. This implement may be worked at any depth, and the distance traversed by the cylinder may be regulated at will. The many details of construction have been purposely omitted.

For the ordinary towing-nets for surface-collecting, and for use in connection with the trawl-wings, silk bolting-cloth, which can be obtained of any size of mesh, has been substituted for the various other kinds of cloth formerly employed. Bolting-cloth, though moderately expensive, is very strong and durable, and the nets constructed of it have given great satisfaction. The towing-net frames are made of heavy brass wire, and are generally circular in shape, though an elongated rectangular frame is sometimes employed.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE PHILADELPHIA MEETING.

WE have made arrangements for publishing reports and abstracts of so many of the papers presented at Philadelphia, that our readers can soon judge for themselves of the scientific importance of the meeting; and we shall therefore restrict our editorial comments, this week, to some general impressions which were formed during the progress of the session.

The intense heat of the first five days was a serious drawback from the pleasure of attendance, but it was the only drawback. It doubtless deterred from the journey a few who would otherwise have been present; but the arrangements of the Philadelphians were so complete, that those who were in the city encountered the minimum of discomfort, and enjoyed the utmost benefits which a great convention can afford. It was particularly fortunate that Saturday was kept free from all sessions, for many persons were thus enabled to devote two days to refreshment by the seashore or in the mountains in the company of their associates and friends. Every thing which could be done by an enlightened and wealthy community, devoted to hospitality, was done to show an interest in, and respect for, the workers in science, American and foreign. Nothing was forgotten or neglected. The permanent officers of the association did their part with the most satisfactory efficiency. Museums, libraries, and collections were freely opened; and the electrical exhibition, though not complete, was far enough advanced to be an attractive and instructive show. The convention of the mining engineers, and the convention of Agassiz clubs, augmented the number of attendants upon the meetings.

The public interest in the sessions, as usual, reached its height at the delivery of the presidential address. On this occasion, Professor Young, as our readers have already discovered, presented a masterly review of the present condition of astronomical science and of the problems which next invite attack. With many bright flashes, his discourse was as orderly as the solar system; and he balanced this view and that with the skill of a trained physicist. It is rare on such anniversaries for

a speaker to be so felicitious in the choice and treatment of his theme. We trust that our readers will pardon us for saying, that by the kindness of the lecturer we were able, at the close of his discourse, to distribute the number of *Science* in which it was printed.

We are inclined to think that the custom which puts the president's address in the evening is unwise. It is usually an elaborate essay, depending for its interest more on its matter than on its style; though, in this, style and matter were both excellent. Sometimes, as at the present session, very close attention must be given by ordinary listeners if they would seize the points of the discourse. Why should this lecture be given in the evening, when everybody is tired, when the gas augments the solar heat, and when many are impatient for the social entertainment which is to follow? Why should it not be delivered at a morning session?

So far as the daily newspapers came under our eye, there seems to be a great falling-off in their abstracts of the papers. The reporters seem to be in despair as to what to select from the superabundance of material, and in many cases their choice is hap-hazard. Indeed, it is very difficult for any one to determine from the programme what will be of most interest, or exactly when particular papers will be read. Some 'sifting' or 'grinding' committee seems indispensable to eliminate such papers as are for any reason inappropriate to these gatherings. There should be a survival of the fittest, and the rest should disappear.

We trust the day will come when it will be considered the mark of a bad education to read or speak indistinctly in public, — when bad utterance will be as great an offence against the usages of good society as bad grammar or bad spelling. More than one speaker in Philadelphia has thwarted his own purposes by his low, inarticulate, or suppressed vocalization. Instead of awaking an interest, he has smothered it. Why should college professors speak so poorly as many of them do?

So far as our observations go, the most useful meetings of the sections appear to be those in which a discussion is provoked upon some interesting question, not necessarily on a new point. For example, such debate as took place in the mechanical section, on instruction in mechanics; or that in the physical section, on thunderstorms; or as that proposed in the chemical section, on the best methods of teaching chemistry, — are valued by all who are present, more, even, than elaborate papers which can hardly be appreciated until they are printed.

The 'special committees' of the association did not appear in a very efficient aspect, when the long list of them (eleven in number) was called Monday morning, with but one written and two oral responses. We may also add, that better modes of promoting the work of the association can be devised than these 'general sessions,' which consume the best hour of the morning, and really accomplish very little good.

The number of members enrolled as present, up to Tuesday morning, was 1,157; and many more have since arrived. The members of the British association have been received with great cordiality; and every proposal to continue the friendly relations which have been fostered this summer, and all proposals looking toward an international scientific congress, are received with great favor.

As a whole, we are sure that the Philadelphia meeting is one of the best, if not the very best, which has ever been held.

COLLEGE MATHEMATICS.[1]

PROFESSOR EDDY announced as the subject of his address, the present state of mathematical training in our colleges; its aims, its needs, and its relations to education and to scientific research. It is an article of faith firmly held and oft expressed by the undergraduate, that higher mathematics is a study which can be thoroughly mastered only by exceptional geniuses. One very bad feature in this state of things is, that this sentiment respecting mathematical study is not confined to undergraduates, but is largely shared, not only by the faculties in general, but by the instructors and professors of mathematics as well.

There are various reasons which have led mathematical teachers to this opinion, besides the ill success that has attended their efforts with their pupils. It must be admitted that, too often, the instructors themselves have not become engrossed in their studies, perhaps not even interested in them. That we have in this country no large body of men whose life-work has been, day by day, directed in the line of mathematical investigation, is evident to all. The paucity of important mathematical investigations emanating from this side of the Atlantic is proof of it. But even where the professorial chair is filled by an eager and brilliant mathematician, he often feels the hopelessness of initiating his pupils into this all-absorbing realm of thought in the few brief months at his disposal. Thus it has come to pass, that the study has been used simply as a form of mental discipline or intellectual gymnastics: the object sought

[1] Abstract of an address to the section of mathematics and astronomy of the American association for the advancement of science, at Philadelphia, Sept. 4, by Prof. H. T. Eddy of the University of Cincinnati, vice-president of the section.