MOSQUITOES VS. TROUT.

MR. C. H. MURRAY of Denver writes to Professor Baird the following letter, which we are permitted to print in advance of its publication by the U. S. fish commission: —

In the middle or latter part of June, — I think it was, — in 1882, I was prospecting on the head-waters of the Tumiche Creek in the Gunnison valley, Col. About nine o'clock in the morning, I sat down in the shade of some willows that skirted a clear but shallow place in the creek. In a quiet part of the water, where their movements were readily discernible, were some fresh-hatched brook or mountain trout; and circling about over the water was a small swarm of mosquitoes. The trout were very young, still having the pellucid sack puffing out from the region of the gills, with the rest of their body almost transparent when they would swim into a portion of the water that was lighted up by direct sunshine. Every few minutes these baby trout — for what purpose I do not know, unless to get the benefit of more air — would come to the surface of the water, so that the top of their head was level with the surface of the water. When this was the case, a mosquito would alight, and immediately transfix the trout by inserting his proboscis, or bill, into the brain of the fish, which seemed incapable of escaping. The mosquito would hold his victim steady until he had extracted all the life juices; and when this was accomplished, and he flew away, the dead trout would turn over on his back, and float down the stream. I was so interested in this before unheard of destruction of fish, that I watched the depredations of these mosquitoes for more than half an hour; and in that time over twenty trout were sucked dry, and their lifeless shells sent floating away with the current. It was the only occasion that I was ever witness to the fact, and I have been unable by inquiry to ascertain if others have observed a similar destruction of fish. I am sure the fish were trout, as the locality was quite near snow line, and the water very cold, and no other fish were in the stream at that altitude. From this observation, I am satisfied that great numbers of trout, and perhaps infant fish of other varieties in clear waters, must come to their death in this way; and, if the fact has not been heretofore recorded, it is important to those interested in pisciculture.

LAST YEAR'S MEETING OF THE AMERICAN ASSOCIATION.

THE proceedings of the American association for the advancement of science for 1884 were ready for publication only just prior to the date appointed for the meeting at Ann Arbor. They extend through 736 pages, to which there is an index covering sixteen pages. As usual, a large part of the papers are represented only by titles and abstracts, some others have already been printed; so that the volume is chiefly to be valued for reference, rather than for the freshness of its contents. It appears to have been carefully edited by the secretary, and to contain in exact and convenient forms all the general information respecting officers, membership, committees, and official acts to which we have been so long accustomed. Of course we cannot allude specifically to the long array of scientific communications here presented; but we will venture to call the attention of the general reader to the various addresses which he will find in the volume, and which, taken collectively, afford a very good insight into the aspect of scientific studies in this country and at this time.

A re-examination of the opening address of Prof. C. A. Young of Princeton, on the 'Pending problems in astronomy,' has confirmed our first impressions of its value. Indeed, we do not hesitate to call it a model discourse for such an occasion. The president of the association selected a theme which he was fully qualified to discuss, — one which enabled him to look forward as well as backward, one which was of equal interest to the astronomer and to the students of other sciences. The style in which he wrote was bright, and fitted to engage the attention of any well-educated person, while it remained free from all that was extraneous or sensational. No better introduction can be found to the present condition of astronomical science.

The addresses of the vice-presidents are also given. That of Professor Eddy is a complaint and an appeal, with respect to the neglect of mathematics by our countrymen, and recalls a like complaint which was made by Professor Newton when he was sectional vice-president a few years ago, and a well-known article by Professor Newcomb in the *North-American review* for 1874. It is difficult to account for the intellectual abstinence of Americans, to which these writers refer, from domains so inexhaustible as those of modern mathematics, except by remembering the eagerness of everybody in this land — scholars and teachers, as well as investors and merchants — for immediate results, — for the concrete rather than the abstract. Professor John Trowbridge entitles his address 'What is electricity?' — a question which he knows, as well as anybody, is easier asked than answered. Nevertheless, around this inquiry he has grouped a large number of important and suggestive statements, which were particularly appropriate at a time when the national electrical congress was about to meet in the city of Franklin. In

this address, and in that of Professor Eddy, the personal experience of the speaker is so introduced as to give a peculiar value to what is said. Professor Langley of Ann Arbor discusses 'Chemical affinity,' "the bud our science put forth in its alchemical stage," but a bud which of late appears to have withered. By an elaborate review he endeavors to show that "it is the word only which has become obsolete; the idea behind it is still active and of great importance." Professor Thurston, now of Cornell, takes a much broader theme, the 'Mission of science,' and naturally falls into a more rhetorical paper. In almost optimistic language he points out the value of applied science, and especially of mechanics as an aid to government in the promotion of social welfare. "The mission of science," he claims, "is to be fulfilled mainly through the application of mechanics." It has made as yet "but the veriest beginning," — but in the end the improvement of mankind and the development of the human soul are within the range of its potentials. The geological address, by Prof. N. H. Winchell, is in marked contrast to that of Professor Thurston. It is a paper of purely professional interest. He discusses, as a geologist, the crystalline rocks of the northwest, and especially of Minnesota. It has been usual to refer these rocks either to the Huronian or the Laurentian: now this nomenclature is acknowledged to be imperfect. The difficulties and incongruities of the situation are clearly set forth. Professor Cope likewise addresses an audience of specialists, — though the biological specialists in these days are a very comprehensive company. His subject is 'Catagenesis;' and he announces his definition of life to be "energy directed by consciousness, or by a mechanism which has originated under the direction of consciousness," — and he concludes that "all forms of energy have originated in the process of running down, or specialization from the primitive energy." Professor Wormley's address on the applications of the microscope in chemical and micrometric observations is only given in abstract. Professor Morse discusses man in the tertiaries, — not any particular man, we may assure our sceptical readers, but the-possibly-to-be-discovered man. "The progenitors of quaternary man, under different genera possibly, are to be sought for in the tertiaries." In the section devoted to economics, Gen. John Eaton very briefly considers scientific methods and scientific knowledge in common affairs.

EXPERIMENTS IN MEMORY.

When we read how one mediaeval saint stood erect in his cell for a week without sleep or food, merely chewing a plantain-leaf out of humility, so as not to be too perfect; how another remained all night up to his neck in a pond that was freezing over; and how others still performed for the glory of God feats no less tasking to their energies, we are inclined to think, that, with the gods of yore, the men, too, have departed, and that the earth is handed over to a race whose will has become as feeble as its faith. But we ought not to yield to these instigations by which the evil one tempts us to disparage our own generation. The gods have somewhat changed their shape, 'tis true, and the men their minds; but both are still alive and vigorous as ever for an eye that can look under superficial disguises. The human energy no longer freezes itself in fish-ponds, and starves itself in cells; but near the north pole, in central Africa, on alpine 'couloirs,' and especially in what are nowadays called 'psycho-physical laboratories,' it may be found as invincible as ever, and ready for every fresh demand. To most people a north-pole expedition would be an easy task, compared with those ineffably tedious measurements of simple mental processes of which Ernst Heinrich Weber set the fashion some forty years ago, and the necessity of extending which in every possible direction becomes more and more apparent to students of the mind. Think of making forty thousand estimates of which is the heavier of two weights, or seventy thousand answers as to whether your skin is touched at two points or at one, and then tabulating and mathematically discussing your results! Insight is to be gained at no less price than this. The new sort of study of the mind bears the same relation to the older psychology that the microscopic anatomy of the body does to the anatomy of its visible form, and the one will undoubtedly be as fruitful and as indispensable as the other.

Dr. Ebbinghaus makes an original addition to heroic psychological literature in the little work whose title we have given. For more than two years he has apparently spent a considerable time each day in committing to memory sets of meaningless syllables, and trying to trace numerically the laws according to which they were retained or forgotten. Most

Ueber das gedächtniss. Untersuchungen zur experimentellen psychologie. Von Herm. Ebbinghaus. Leipzig, *Duncker u. Humblot*, 1885. 10+169 p. 8°.