SCIENCE:

A Weekly Record of Scientific Progress.

JOHN MICHELS, Editor.

Published at

229 BROADWAY, NEW YORK.

P. O. Box 3838.

SATURDAY, JULY 17, 1880.

To Correspondents.

All communications should be addressed to the Editor—Box 3838, P. O., New York—with name and address of writer, not necessarily for publication without consent.

Scientific papers and correspondence intended for publication, should be written *legibly* on one side only of the paper. Articles thus received will be returned when found unsuitable for the Journal.

Those engaged in Scientific Research are invited to make this Journal the medium of recording their work, and facilities will be extended to those desirous of publishing original communications possessing merit.

Proceedings of Scientific Societies will be recorded, but the abstracts furnished must be signed by the Secretaries.

Both questions and answers in "Notes and Queries" should be made as brief as possible; an answer appearing to demand an elaborate reply, may be written in the form of an article.

To Subscribers.

Terms of subscription for Science will be $4 a year, payable in advance. Six months, $2.50. Single copies 10 cents.

Subscriptions forwarded by mail should be addressed to the Editor, Box 3838, P. O., New York, and Post-office orders made payable to "John Michels."

To Advertisers.

Terms for advertising may be obtained at the office of Journal, 229 Broadway.

CO-OPERATION IN SCIENCE.

At this season of rest and recreation, naturalists are now wandering on many a hill and dale or upon the breezy shore, intent on collecting specimens which shall employ their leisure hours in the Autumn and coming Winter. From the close precincts of a city, who would not be free and join the little band, who with nets, bottles, corks and pins, are now seeking things bright and rare, which Nature has so lavishly scattered, and yet with such a cunning hand, that even the search and gathering affords delight to those who diligently seek.

The number of collectors is steadily increasing, but when we contemplate the immense ground to be covered, the necessity for increasing the force becomes but too apparent. Not only have the depths of mighty oceans to be explored, and the bottom of great seas investigated; but also tiny denizens of little rock pools must be described and classified. The surface of the earth might seem too immense to be minutely examined by the naturalist, but still he has to descend many hundred feet into the bowels of the earth to there find records of past life, so as to complete the great catalogue of Nature's works.

Earth, air, and water have thus to be surveyed, and still another world of life and form which is invisible to the natural vision of man. These microscopic forms are not to be neglected, for they decimate populations and destroy the industry of nations, and are so numerous, that the accumulation of their countless numbers rear up mighty ranges of mountains.

With such a work before collectors who are hopefully struggling to add to our garner of a knowledge of Nature, who cannot desire that their number may be increased. Yet how easily it might be done. From the fact that some of our best collectors are not scientific men, it would seem that a convenient division of labor is here suggested, namely: the amateur who collects, and the scientist who describes and classifies. Some men possess special qualifications for collecting, they discover localities which others would never dream of, and they have a happy knack of always finding what they are in search of. Such expertness may be largely due to constant practice, but the professional scientist finds himself tied to his study and laboratory, and has no time for these constant perambulations; he must therefore largely rely on the amateur collector for his material, as the latter must depend on him, for his technical and scientific knowledge.

If therefore, there are two classes who are dependent upon each other for the extension of a great and valuable work, let that co-operation be more distinctly recognized and accepted, for such is far from being the case at the present time, particularly in the United States, where of all places it might be expected to thrive.

One of the best means of organizing an efficient corps of amateur workers, is the establishment of local scientific societies, and the circulation of moderate priced but strictly first-class scientific journals.

In Europe, and especially England, scientific societies, chiefly supported by amateurs, are now doing excellent work; but in the United States (with a few exceptions) they drag on a miserable existence of poverty and inutility. What is the cause of this? Simply a want of co-operation between the amateur and professional scientist, and a due regard for each other's position.

To be effective, the officers and council of a scientific society should be taken from the best professional scientists in the neighborhood—men able to command and organize the work of the society, and give a

character and tone to its proceedings. The amateurs must constitute the rank and file, accept that position, and keep to it, until by some special qualifications they may be promoted to a higher grade.

In England such is the case. Taking the case of the Quekett Microscopical Society, such men as Professor Huxley, Dr. Lionel Beale and Dr. Cobbold, the eminent helminthologist, have presided over the proceedings, and the result has been that over five hundred members have enlisted under such leadership. Compare this with the American Microscopical Society of New York established in the same year. Who ever heard of a paper read before this body, or a single piece of scientific work performed by one of its members? No fossil could be more inactive than this society; it exists on paper only, and for the benefit of a few officials.

A younger Microscopical Society, established in New York city about three years since, has been organized on an equally faulty basis, and now numbers but thirty members. The co-operation of the right men has never been asked, and probably would not be accepted, and in consequence, a future of inactivity and embarassment may be anticipated.

To make American Scientific Societies as effective as those in England, they must be organized on a sufficiently popular basis, to interest the sympathy and support of the public; and presided over by men of known scientific ability, whose presence will encourage the student, and give a character to the proceedings.

In regard to the aid given by scientific journals in promoting useful co-operation between the scientist and the student, we may state that one of the objects of "SCIENCE" is to promote such a consummation, and that aim will be constantly kept in view. As a step in the right direction we have here indicated some of the means, by which the icy barrier which now separates those who should be cordially united in a great work, may be gently thawed by the inspiring influences of united action and generous co-operation.

A SCHOOL of agriculture has been formed at Canterbury, New Zealand, situated at Lincoln, twelve miles from the city of Canterbury. This institution is under the direction of Mr. W. E. Ivey, comprises lecture theatre, library, museum, chemical laboratory. A farm of 500 acres is attached to the institution, a portion of which will be devoted to experimental purposes for testing the various methods of cultivation.

M. DAUBREE, director of the French School of Mines, has published an essay on Descartes, in which he summarises the services rendered by that philosopher to science. He reminds his readers that Descartes advocated the theory of an igneous origin for the earth, and he enters into a lengthened discussion of the objections which may be raised against the theory of actual causes.

THE Earl of Spencer, in a recent speech in the House of Lords, *admitted* the application of science to agriculture. He said: "Great attention had of late years been very properly called to the great aid which science gave to the various classes of manufactures and producers; and that principle applied with quite as great force to agriculture as to any other art. If science could enable our agriculturists to produce more from the land than they had hitherto done, it would add another to the many useful things it had been the means of accomplishing." These words might, with some propriety, have been spoken twenty years ago, and if they represent the present relation of science to British agriculture, much of the unprofitable results of farming in that country may be thus explained.

LORD Spencer said, that it had been at last decided to open a class for agriculture next August, at the Department of Science and Art. We commend Lord Spencer to a perusal of the reports of the department of Agriculture at Washington, especially that for 1878, in which the value of science to the agriculturist is very evident.

THE value of scientific journals has been attested to, by the humble class of astronomers who exhibit their telescopes at corners of streets in Paris, showing the moon, planets and other celestial objects which may be seen with telescopes of moderate quality. They state that since the publication of the *Astronomie Populaire* the number of their customers has nearly doubled.

IT appears from a statement by M. Flammarion that the scientific journalists of Paris meet monthly, when papers are read, and other business transacted.

M. J. M. GAUGAIN, the eminent French electrician, recently died at the age of seventy years.

At a recent trial in England, a gas company was sued for damages, the plaintiff having been rendered insensible by an escape of the company's gas, due to a breakage in their mains. The plaintiff alleged that he suffered for a considerable length of time after the accident, and was unfit for business. The jury accepted the view of Dr. Tidy and Dr. Hastings, who gave scientific evidence on the subject, they being of the opinion that the effect of inhaling coal gas was very transitory; and that if sufficient was not inhaled to cause death, it would shortly pass from the system, and its ill effects cease.

CORRESPONDENCE.

To the Editor of Science:

DEAR SIR:—In the Physical Laboratory we noticed last Winter a beautiful experiment with vapors. An alcohol lamp, burning, was put under the receiver of the air pump. A few strokes put out the flame. The air returning, a single stroke of the piston caused the receiver to fill with a dense and transient cloud, soon disappearing with a change of pressure in the receiver. This experiment has interesting relations to rain fall, and other meteorological phenomena.

G. M. MANSFIELD.

Laboratory of Asbury University,
Indiana, July 7, 1880.