NEW YORK ACADEMY OF SCIENCES.

The chemical section of the Academy of Sciences held their regular monthly meeting at 64 Madison avenue, Monday evening, May 14, 1877, Dr. J. S. Newberry, President, in the chair.

Mr. Henry Newton, E.M., exhibited some plates illustrating the palæontology of the Black Hills. The President spoke of the failure on the part of Congress to appropriate sufficient funds to pay the cost of their publication, thus throwing much of the expense of this very useful and practical survey upon Mr. Newton and his colleagues. Mr. Newton will soon return to the Black Hills to finish the survey begun by him and Mr. W. P. Jenney last season.

Mr. C. Chamberlain exhibited a specimen of the new mineral—astrophyllite—from El Pasoz county, Colorado. This mineral contains 13 ingredients, including titanium, tantalum, copper, etc. It is micaceous, but the lamina are not flexible; it is of a yellowish color, and in powder looks like Mosaic gold. Also specimens of analcite with apophyllite, from Lake Superior.

The first paper of the evening was entitled

THE RELATION BETWEEN MALARIA AND VEGETATION,

as shown in the vicinity of New York, by General Egbert L. Viele. The speaker began by stating that in his plan of Central Park, which he made twenty years ago, he made a botanical garden one of the features of the Park. It was thrown out then, but now it is proposed to do what he then proposed. He next spoke of the drainage of the city, and exhibited a map showing the ancient watercourses. Many of these streams, he said, were supplied from perpetual springs, which will continue to flow until the end of time, yet no provision has been made to carry off the water of these springs; the city is absolutely without drainage. He had hoped that a botanical garden in the Park would develop certain plants that have the power of neutralizing the injurious effects arising from want of drainage. At that time 70,000 species of flowers and trees were growing in the Park, most of them being kept browsed down to 6 inches or a foot. The relation between plants and animals was next referred to, and much credit given to the researches of Tyndall, Huxley, Darwin, Pasteur, Bastian, and Haeckel. The opposite views of these investigators had promoted research and had been of great benefit, but much still remains unknown. The microscopist knows how close is the resemblance of plants to animals in the lower forms of life, how they seem to pass from one to the other. In higher forms of life, the refuse of one is the food of the other, so that they mutually sustain each other. An equilibrium of the two is a necessity for a wholesome state of the atmosphere. The tendency of civilization and the gravitation of people together into large cities is upsetting the equilibrium of natural forces. There is not enough vegetable life here to consume the refuse of the animal life. What are these surplus elements? They are everything that is offensive to any of the senses, whether in air, earth or water, indoors or out of doors, by day or by night. One of the results of this surplus of animal refuse is malaria. It has been established that there are present everywhere certain destructive principles which may at times and under favorable circumstances develop into malaria. We owe this word *mal aria* to the Romans, and it meant with them "bad air," which is recognized the world over as the cause of disease. The Greeks called it *miasma*, and built temples to Æsculapius to void off its evils. We wonder at their idolatry and ignorance, but our own ignorance is almost as great in regard to its true character. Malaria implies bad air; miasm, infection floating in the air. Under what circumstances does air become an agent in propagating such diseases as plague, cholera, yellow fever, and smallpox, which have destroyed millions, and are still at their deadly work? The speaker then spoke of the usual classification of diseases for statistical purposes, under "malarial," "zymotic," etc., in which malarial embraces all those which distinguish one country from another, one year from another, and which have at times decimated cities and countries. He stated that three fifths of all the deaths in the world result from miasmatic diseases. These have gone on from age to age almost unchecked and unrestrained, the average death rate increasing. He then spoke of the plague, cholera, smallpox, yellow fever, and their ravages in historical times; and said that an erroneous impression prevailed that malarial diseases are restricted to intermittent fever, chills, and fever and ague, which prevail wherever drainage is defective or the soil has been disturbed. People think that these fevers are never fatal, and come to think of malaria as something we can endure and become accustomed to. There were 30,000 deaths in this city last year, more than half of which were due to malarial diseases. He next referred to the three chief theories held by physicians in regard to malarial diseases; first, the gaseous theory, that they are due to certain gases; secondly, the vegetable theory, that they are due to germs; thirdly, the specific poison theory. Malaria has a history, a geology, a botany, a chemistry, a topography, a geography; yet all these have failed to explain it. It is hoped that the new science of biology will do more for it. Many of these diseases attack a person but once, and are contagious; a certain time elapses between exposure and the development of the disease. They generally run a certain length of time. These are called acute specific diseases. Could any gas do this? We know none with such power. The theory of specific poison only substitutes a general term and explains nothing, but only removes the question a step further. The vegetable theory is most worthy of study by biologists. The speaker exhibited a drawing of the *penicillium glaucus* magnified, also of a drop of blood from a patient that died within 48 hours with smallpox; the latter viewed under a microscope was as lively as a pond full of fish. The similarity of the two forms was quite remarkable.

Nearly the entire food of plants is derived from the air. It must be the refuse of the animal world, things which are hurtful to animal life. We all know that the country, where vegetable life predominates, is more healthy than the town. Tyndall has shown the presence of minute organisms in the air, and how they can be developed into larger forms. This island was, in its primitive state, a most beautiful place, and now how changed! Nature is for ever dethroned, the rivers are encroached upon and polluted, watercourses are cut off; the supersaturated soil gives off these germs of disease which make it as bad as the Roman Campagna. Central Park has become a mass of shrubbery through which no winds can blow, and is dotted with pools of stagnant water. Let this be remedied, and let botanists plant there those trees which are capable of consuming most of these poisons, and let our citizens aid to destroy the poison by the same means. The speaker concluded by pointing out on maps that, where fevers most abound, there have formerly been watercourses, and showed that the Roman fever was likewise brought about by the destruction of drainage systems and watercourses.

A somewhat spirited discussion followed, in which Dr. Newberry remarked that the *globulus* and the other species of *eucalyptus* known to us at present, are not sufficiently hardy to endure our climate, but expressed a hope that the mountainous portions of Tasmania might yet give us a more hardy species, or that those known may be gradually acclimatized to our latitude by beginning to cultivate them further south.

Mr. Alfred R. Conkling then read a very interesting paper on the

GEOLOGY OF LAKE TAHOE AND VICINITY,

illustrated by a large blackboard map. The region about this lake seems to be an exceedingly interesting one. On the east side, near Carson City, are several hot springs with water at temperatures of 111° Fah. to 120°. The formation is quarternary. There are several gold mines on the east side of the lake, in quartz and granite, and several shafts have been sunk. In some of these mines copper minerals are also found. At the northern end of the lake is a peak called Mount Rose, 1,082 feet high. There are two other outcrops of igneous rocks on the east summit, one of which is called Shakespeare's Cliff, from the grouping of lichens on one side, which resemble that famous dramatist. The other is called Cave Rock. The lake itself is 21 miles long, and 12 broad at the widest part. Its depth near the south end is 900 feet, and increases to 1,645 near the north end. The temperature of the water is 54° Fah. It lies 6,000 feet above the level of the sea. On the west side are mineral springs whose waters contain carbonic acid and sulpheretted hydrogen gases, and have a temperature of 46° Fah. They are bottled and sent to Carson City. On the same side are some ridges and peaks. Evidences of ancient glacials are abundant. One of these old glaciers was equal to the Mer de Glace. The paths of several others are marked by morains. In the neighborhood are some small lakes, the basins of which may have been dug out by glaciers. At the southwestern side is a bed of graphite. Echo Lake, near by, is so called because there is no echo there. North of the lake is a hot spring, the water of which has a temperature of 132° Fah.

Dr. Newberry made a few remarks on this interesting phenomenon of a deep cold lake on the top of a mountain, and the probability of its being the result of glacial action.

Fly Paper.

Powdered black pepper is mixed with syrup to a thick paste, which is spread by means of a broad brush upon coarse blotting paper. Common brown syrup will answer, but syrup made from sugar is preferable, as it dries quicker. For use, a piece of this paper is laid upon a plate and dampened with water. The paper may also be made directly at the mill by adding sugar to the pulp, and afterwards ¼ to ⅓ of powdered black pepper, and rapidly working it into a porous absorbent paper.

INTERNATIONAL POSTAL ORDER SYSTEM.

Since the system of interchange of our postal orders with those of foreign countries, persons abroad can remit small amounts to this country safely and without any trouble. It is a great convenience to the public to be able thus to transmit money, and to publishers it proves especially convenient.

In a letter before us, from Leeds, England, the writer states: "There appears some difficulty in getting your papers at reasonable prices in this country. We are at the mercy of news agents, who seem to charge what they like. I would suggest the advisability of your inserting the subscription price by post, as a means of increasing the circulation of the paper to a considerable extent, for it is increasing every day in the estimation of engineers and others." Now, had it occurred to our correspondent that he could readily have deposited his pounds or shillings with the postmaster at Leeds, to be transmitted to us, he would probably have done so, in place of scolding the news dealers; and likely there are many other intelligent foreigners who would like to have the SCIENTIFIC AMERICAN, but who do not know how to remit for it. So, in accordance with the suggestion of our correspondent, we annex a list of prices, in the currency of different countries, for the SCIENTIFIC AMERICAN, for the SCIENTIFIC AMERICAN SUPPLEMENT, and for both papers, as the subscriber may desire:

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NEW BOOKS AND PUBLICATIONS.

HOW TO TEACH ACCORDING TO TEMPERAMENT AND MENTAL DEVELOPMENT; or Phrenology in the School Room and the Family. By Nelson Sizar. Illustrated. Price $1.50. New York; S. R. Wells & Co., 737 Broadway.

Although physiologists generally believe that phrenology has not yet settled itself into a fixed science, its disciples invariably use its theories as mathematical axioms and undisputed facts. The many instances in which its teachings are nullified, by the fine skull development of many idiots and criminals, have done little to shake the faith of believers in the suggestions of Gall and Spurzheim; and as is usual in such cases, those celebrated craniologists would have been surprised to find their ideas (founded with apparent justification on the comparison of many heads) resolved into arguments as to the direction of the studies of youth. The volume before us attempts to do this; and it is illustrated by engravings of various types of heads, from which many people might deduce a theory that a man's errors and vices are due not to his immoral nature or his neglect of self-control, but to the shape of his head.

HOW TO RAISE FRUITS: a Handbook of Fruit Culture. By Thomas Gregg. Illustrated. Price $1.00. New York city: S. R. Wells & Co., 737 Broadway.

This little book is a thoroughly excellent and practical treatise; and it has our special commendation, not only on account of its valuable instruction to fruit growers, but for its convincing demonstration of the value of fruit, to the farmer as a source of a revenue, and to the consumer as an article of diet.

A HISTORY AND HANDBOOK OF PHOTOGRAPHY. Translated from the French of Gaston Tissandier. Edited by J. Thomson, F.R.G.S. New York city: Scovill Manufacturing Company, 419 to 421 Broome street.

M. Tissandier is the editor of our excellent contemporary *La Nature*, and one of the best French writers on popular scientific topics. In the present volume he has combined a history and a useful manual of the photographic art, the latter of which is excellently adapted for the purposes of the amateur. For general perusal, the work can be especially commended, as it gives in pleasant, readable style, a capital account not only of photography but of many of the new processes, for the mechanical reproduction of pictures, dependent on photographic manipulation. The subjects of photo-micrography and astronomical photography are fully discussed. The illustrations are numerous and remarkably good; and an appendix is added, giving many valuable practical recipes.

Inventions Patented in England by Americans.

From April 24 to April 30, 1877, inclusive.

CARRYING WEIGHTS.—J. E. Barlow, Sing Sing, N. Y.
CHEMICAL TELEGRAPH.—C. A. Randall *et al.*, New York city.
CONCENTRATING SULPHURIC ACID.—F. W. Kalbfleisch, Brooklyn, N. Y.
EMERY WHEEL.—I. P. Brown, Jr., Newark, N. J.
FEED WATER HEATER.—G. Steel, New York city.
HYDRAULIC LIFT, ETC.—H. R. Plimpton, Boston, Mass.
JOURNAL BOX AND BEARING.—W. B. Bishop, New York city.
LIFE BOAT.—G. Bates, Massachusetts.
MILLING MACHINERY, ETC.—T. D. Jones, Syracuse, N. Y.
PROPELLING VESSELS, ETC.—J. H. Carpenter, New York city.
RECORDING THERMOMETER, ETC.—R. K. Boyle, New York city.
REDUCING ORES, ETC.—C. M. Dupuy, Philadelphia, Pa.
REFRIGERATOR CAR.—J. M. Ayer, Chicago, Ill.
SHIP'S BERTH, ETC.—J. C. Thompson (of Brooklyn, N. Y.), London, Eng.

Recent American and Foreign Patents.

Notice to Patentees.

Inventors who are desirous of disposing of their patents would find it greatly to their advantage to have them illustrated in the SCIENTIFIC AMERICAN. We are prepared to get up first-class WOOD ENGRAVINGS of inventions of merit, and publish them in the SCIENTIFIC AMERICAN on very reasonable terms.

We shall be pleased to make estimates as to cost of engravings on receipt of photographs, sketches, or copies of patents. After publication, the cuts become the property of the person ordering them, and will be found of value for circulars and for publication in other papers.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED COMBINED COTTON CHOPPER AND SCRAPER.

Empson C. L. Bridges, Brick Church, Tenn.—In this machine the frame to which the hoes or choppers are attached is vibrated by suitable gear connection with the transporting wheels, and the said vibrating frame can be raised and lowered by a crank shaft, and adjusted forward or back by a like adjustment of the sliding frame to which it is attached. The scraper, which goes in advance of the chopping mechanism, may be adjusted laterally by a treadle mechanism.

IMPROVED CAR COUPLING.

Edward B. Middleton, Charleston, S. C.—This coupling is composed of a hook fixed on a rod which slides vertically in suitable bearings in the drawhead. When two cars meet, the hook engages with a catch block, which is also fixed on a vertically sliding rod in the opposite drawhead. The upper ends of the said rods project above the drawheads and are provided with enlarged heads which are so constructed that they tend to hold the hook and catch block in proper position, lengthwise with the drawhead.