with to make it valuable as a handbook, but the work will serve a good purpose in stimulating a desire on the part of the reader to know more of the subject and lead him to examine some of the more complete works.

ALBERT F. WOODS.

THE CYCLOPEDIA OF AMERICAN HORTICULTURE.*

IT is scarcely a year since the first volume of Bailey and Miller's Cyclopedia of American Horticulture appeared. The third volume, bringing the work down to page 1486, has now come from the press, and there is reason to hope that the concluding volume will not be delayed much beyond the end of the summer. Considering the large number of persons who have written 'copy,' the many illustrations to be selected and prepared, and the extent of the work, this promptness of publication is not only deserving of commendation but quite remarkable.

What has been said of the quality of the earlier volumes (SCIENCE, June 1 and August 10, 1900) applies equally to the one now under consideration. Perhaps the general reader will be most interested in the excellent brief horticultural treatment of the States the names of which begin with N to P—therefore comprising most of the great horticultural States of the country—and of the Philippines and Porto Rico, and in the articles on parks, perfumery gardening, photography as applied to horticulture, physiology of plants, plant breeding, and the correct methods of potting and pruning plants. The most extensive botanical monographs are those of *Opuntia*, *Pinus*, *Populus*, *Prunus*, *Pyrus* and *Quercus;* and the most important horticultural monographs, aside from some of these, are those of the Orange, Peach, Pear, *Pelargonium*, Pecan and *Primula*.

T.

SOCIETIES AND ACADEMIES.

THE AMERICAN PHYSICAL SOCIETY.

AT the meeting of the Society, held at Columbia University, on April 27th, Professor A. A. Michelson, of Chicago, was elected president to fill the vacancy caused by the death of Professor H. A. Rowland, and Professor A. G. Webster, of Clark University, was elected vice-president. The following resolution was adopted and made a part of the minutes:

The Physical Society desires to record its deep sense of sorrow for the death of its late president, Professor H. A. Rowland, and its appreciation of his services to science. By his brilliant researches he did much to advance our knowledge of physics, and by his work as a professor he stimulated many students to greater zeal for accurate scholarship and scientific investigation. His interest in the Society was shown from its beginning, and it owes much to the care with which he watched over the organization. By his death the Society, the science which it represents, and our country have sustained a loss which will be severely felt.

At the same meeting of the Physical Society Professor S. W. Stratton gave an account of the organization of the National Bureau of Standards which is to be established at Washington, and which, it is hoped, will prove of great value both to the scientific workers of the country and to manufacturers.

A paper by Mr. Bergen Davis on a 'New Phenomenon produced by Stationary Sound Waves' described some interesting quantitative experiments with organ pipes. The apparatus and methods employed by Mr. Davis gave results in close accord with what theory would predict, and they make it appear possible to bring the experimental study of these subjects on to an exact quantitative basis.

Mr. H. J. Hotchkiss presented a paper on the 'Counter E. M. F. of the Electric Arc,' giving an account of an experimental study of one phase of this much-discussed question. Mr. Hotchkiss employed an oscillograph, of a type which he has developed and used in numerous previous investigations, to determine whether the arc contains a counter electromotive force which lasts for an appreciable time after the current has been removed. The period of the needle of the oscillograph was about 1/5,000 of a second, and a study of the curves obtained by it has led Mr. Hotchkiss to the conclusion that if a counter electromotive force does exist, which lasts as long as a ten-thousandth of a second after the current is broken, then the

*Bailey, L. H. and Miller, W. Cyclopedia of American Horticulture. N–Q. Pp. xv + 432. Pl. 11 + ff. 606. New York, 1901. The Macmillan Company. Price, $5.00.

average value of this E. M. F. cannot exceed $\frac{2}{3}$ of a volt. The paper also described experiments to determine the conductivity of the arc after the circuit was broken. The conductivity was found to depend upon the direction in which current was sent through the arc, and the results seem to indicate something in the nature of a counter E. M. F., whose value is less than one volt.

Professor A. G. Webster showed a method by which the Maxwell top might be used to indicate the path of the invariable axis in a body moving under the influence of no forces. A second paper by Professor Webster described quantitative experiments with a top. The traces obtained from the top under various known conditions were found to agree satisfactorily with the predictions of theory.

A paper by Professor E. L. Nichols on the 'Efficiency of the Acetylene Flame' gave the results of experiments on this subject since the presentation of Professor Nichols' previous paper in June. The values obtained at that time have been only slightly modified by the later work.

A paper on the 'Specific Heats of Electrolytes,' by Professor W. F. Magie, gave a formula for computing the specific heat in the case of solutions in which electrolytic dissociation occurs. A comparison with experimentally determined values showed an extremely satisfactory agreement.

A paper by Mr. J. W. Miller, on the 'Elastic Properties of Helical Springs,' describing numerous experiments on this subject, completed the program.

Ernest Merritt.

CHEMICAL SOCIETY OF WASHINGTON.

The 126th regular meeting was held April 11th, when the following program was presented:

'A New Method for the Estimation of Cane Sugar, in presence of Lactose,' by L. M. Tolman. Benzolsulphinide was used as the hydrolyzing agent, because it has no action on the rotation of lactose, even after heating for several hours, while a solution of sucrose is completely inverted in 30 minutes, by use of one-half gram of the sulphinide. The results obtained showed that it was a satisfactory and accurate method. The method used in condensed milk was as follows: Twice the normal weight of the milk was weighed into a 200-cc. flask and 10 cc. of a 10-per-cent. solution of citric acid added to coagulate the casein. The liquor was then filtered, 75 cc. of the filtrate measured into a 100-cc. flask, one half gram of saccharine added and, after shaking, in order to break up the lumps, immersed in a boiling water bath for 30 minutes. Two cc. of acid mercuric nitrate were then added, the solution made up to volume, filtered and polarized at as near 20° C. as possible. The direct reading was taken in the ordinary way and the volume of precipitate corrected for by double dilution. The results obtained were very satisfactory.

'Classification of Alkali Soils,' by Frank K. Cameron. The views presented in this paper may be summarized as follows: (1) A classification as black alkali or white alkali, depending upon the presence or absence of sodium carbonate, is inadequate in view of our present knowledge of alkali phenomena. A more comprehensive classification is desirable. Such a classification appears to be possible on chemical grounds, considering alkali conditions as the result of the action of aqueous solutions of certain soluble salts upon less soluble salts. (2) The action of sodium chloride solutions upon gypsum is the predominating feature in certain areas and seems to be well typified by the conditions in the valley of the Pecos in New Mexico. The solubility of the gypsum is apparently much increased by the presence of the sodium chloride due to the formation of the soluble salts, sodium sulphate and calcium chloride. In such an area practically the only salts which will have to be considered in the ground solutions are sodium chloride and sodium sulphate, as well as calcium sulphate. Calcium chloride is sometimes found concentrated to a considerable extent, but usually in localized and generally small spots. Owing to its keeping the soil of these spots moister and, therefore, darker than the surrounding soils, such spots are locally known as black alkali spots. (3) The action of solutions of sodium chloride upon calcium carbonate is the predominating feature of some areas. The region about

Fresno, Cal., seems to furnish a good illustration of this class. As a result there is always found a greater or less formation of sodium carbonate, the soluble and very noxious component of black alkali, and the very soluble calcium chloride. Such regions are generally further characterized by the presence of a hardpan at a distance of a few feet below the surface and generally parallel to it, the cementing material of which is calcium carbonate. In such areas there is a tendency toward an accumulation of the soluble carbonates at the surface of the soil. Calcium chloride accumulations, in spots of comparatively restricted area, are frequent accompaniments and are often mistaken for bad black alkali spots, although the presence of soluble carbonates in more than very small quantities is an impossibility. (4) The class of alkali most commonly encountered is that in which the predominating feature is the simultaneous action of solutions of sodium chloride upon gypsum and calcium carbonate. In such an area the formation of soluble carbonates can take place to only a very limited, generally negligible, extent. The apparent increase in the solubility of the gypsum is also much less than when the calcium carbonate is not present. The alkali of the Salt Lake Valley appears to be a good illustration of this type. (5) Much less frequently other types of alkali are encountered, as at Billings, Mont., where the soluble material in the soils appears to be almost entirely sulphates. (6) Modifications of the types described above are more or less frequently found. They may possibly be of such importance as to warrant a separate classification, as, for example, the conditions found to exist in the valley of the Sevier, Utah. (7) The classification here proposed is believed to be comprehensive and is founded on scientific principles. It is elastic and will readily admit of modifications. Principles other than those now recognized in it may be introduced without the accompaniment of radical changes. It can be made as specific as the advance of our knowledge from time to time will justify.

'Chemical Examination of Alkali Soils,' by Atherton Seidell. In this paper the author pointed out the necessity for uniform methods in the examination of the water-soluble compounds of alkali soils, in order that the work of various investigators may be compared. A description of the procedure and methods in use in the U. S. Department of Agriculture was given, with a full discussion of the basis therefor. The unique features are the preparation of the solution for analysis, the preliminary determination of the salt content, by means of the electrolytic bridge, and the determination of carbonates, bicarbonates and chlorides. The statement of the results was also discussed at length.

L. S. MUNSON,
Secretary.

THE ONONDAGA ACADEMY OF SCIENCE.

THE 46th regular meeting of the Society was held in the Historical Rooms, on April 19, 1901.

The first paper was by Professor J. D. Wilson, entitled 'The Fauna of the Goniatite Limestone.' In most places this formation consists of two layers of rock scarcely more than two feet in thickness, but exceedingly rich in goniatites and other cephalopods. He had collected 18 varieties of goniatites, orthocerata, and related forms, nearly all of them confined to the upper layer of limestone. Recently he had found several specimens, one a coiled form, evidently related to *Gyroceras transversum*, and ornamented with nodes, but having a cross section distinctly decahedral. The name *Thoracoceras Wilsoni* is suggested. In the discussion Professor Philip F. Schneider called attention to a much smaller and less prominent fauna of the limestone, which is principally confined to the lower layer. It consists of 3 gasteropods, 2 pteropods, 1 brachiopod and 1 trilobite, thus increasing the list to 25 specimens.

The second paper, entitled 'Recent Theories as to the Cause of the Glacial Period,' was given by Dr. T. C. Hopkins of Syracuse University. He spoke briefly of several of the recent theories and carefully described the 'Atmospheric Theory.' This theory is based on the principle that slight variations in the amount of carbonic acid and watery vapor present in the atmosphere produce grave changes in its temperature, and he would entirely account for the great differences in the tempera-

ture of the past in this manner. The detail of the theory resolves itself into a question of accounting for the differences in the amount of carbonic acid present, all of which was carefully worked out and described by Dr. Hopkins.

A plan for the federation of all local societies with kindred interests was favorably discussed.

PHILIP F. SCHNEIDER,
Corresponding Secretary.

THE BACONIAN CLUB, STATE UNIVERSITY OF IOWA.

THE following formal papers have been read during the current year:

'Forestry in Iowa': Assistant Professor B. Shimek.

'The Extent and Significance of Food Adulterations': Dr. E. W. Rockwood.

'The Geology and Scenery of the Pipestone Region': Professor Samuel Calvin.

'Some Features of the Architecture in Westminster Abbey': Dr. J. G. Gilchrist.

'Jelly Fishes and their Relation to the Hydroid Colony': Professor C. C. Nutting.

'Three Famous Problems in Geometry': Dr. J. V. Westfall.

'A Sketch of the Geology of Canada': Mr. R. D. George.

'The Rôle of Insects in the Spread of Diseases': Dr. W. L. Bierring.

'The Mechanics of a Harp String': Professor Laenas G. Weld.

'Concerning the Scope of University Training': Professor Launcelot W. Andrews.

'The Psychology of Profanity': Professor G. T. W. Patrick.

'The Lost Art of Wood Engraving': Mr. John Springer.

'Some Features of the Road Problem': Professor A. V. Sims.

'The Inscribed Polygon of Seventeen Sides': Assistant Professor Arthur G. Smith.

'The Sympathetic Relation of the Two Eyes': Dr. F. J. Newberry.

'Measurement by Light Waves': Mr. Charles F. Lorenz.

'The Pecuniary Economy of Foods': Mr. A. M. Goettsch.

'Twentieth Century Protoplasm': Professor T. H. Macbride.

'The Psychological Theory of Organic Evolution': Dr H. Heath Bawden.

'Photographic Optics': Professor A. A. Veblen.

'The Modern Theory of Solution': Dr. Carl von Ende.

'Railroad Construction': Mr. W. D. Weeks.

'The Causes of Blindness in Iowa': Dr. L. W. Dean.

Several of the above papers were original contributions to science and have been or will be published.

Among the voluntary reports that have been given during the year the following deserve mention as first announcements: December 7, Professor C. C. Nutting reported on the discovery of a new method of reproduction among the hydro-medusæ. The hydranth has been seen to proceed from the proboscis of the medusa, by a process of budding. December 14th, Professor A. A. Veblen exhibited a new copying-camera table which is capable of all needed adjustments. January 4th, Dr. J. G. Gilchrist reported upon the successful treatment by trephining of three cases of epilepsy of long standing. February 15th, Professor Launcelot W. Andrews exhibited a model to illustrate the process of electrolysis. The same model illustrates Faraday's law of the decomposition of chemical substances. April 26th, Miss Mabel Williams reported the discovery of 'the area-volume illusion,' according to which any dimension of a surface seems larger than the corresponding line and one face of a volume seems larger than the corresponding plane surface. The speaker has demonstrated that the illusion is due to the presence of the judgment 'there is more of it,' which exerts a subconscious influence in the perception. October 12th, the secretary exhibited a new ergograph, and April 19th, new apparatus employed in the study of the voluntary control of the pitch of the voice in singing and speaking. C. E. SEASHORE,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

AT the meeting of the Academy of Science of St. Louis on the evening of May 6th, twenty-two persons present, Mr. C. F. Baker presented an embryological demonstration, including gross and microscopic specimens, covering the development of the chick during the first forty-eight hours of incubation, intended to illustrate a working course in embryology for high schools.

One person was elected to active membership. WILLIAM TRELEASE,
Recording Secretary.

ELISHA MITCHELL SCIENTIFIC SOCIETY.

AT the 135th meeting of the Society on May 4th, the following papers were read:

'Transit Methods for Laying Sewer Grades': Mr. Wm. Cain.

'Acid Crystallization': Mr. Charles Baskerville.

'The Probable Complexity of Thorium': Mr. Chas. Baskerville.

'The Recent Geological Formations of the Mississippi Valley': Mr. J. A. Holmes.

CHAS. BASKERVILLE,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE LARYNX AS AN INSTRUMENT OF MUSIC.

TO THE EDITOR OF SCIENCE: In this week's number of SCIENCE Professor Joseph Le Conte remarks upon Professor Scripture's description of the mode of action of the vocal chords, and quotes from a work of his own to show that the larynx 'cannot be likened to a stringed instrument nor to a reed-pipe,' continuing, "It is strange that no one has thought to liken it to an ordinary horn; a stage horn, or better, a French horn."

In Helmholtz's 'Tonempfindungen,' of which the first edition was published in 1862, occurs, under the caption, 'Membranöse Zungen,' the following statement: 'Als musikalische Instrumente kommen nur zwei Arten solcher membranöser Zungen in Betracht, nämlich die menschlichen Lippen beim Anblasen der Blechinstrumente und der menschliche Kehlkopf in Gesange.'

This is the exact comparison suggested by Professor Le Conte. There follows a minute description of the mode of action of the vocal chords, and of the action of the lips in blowing a horn, which has never needed any improvement or correction. Both these cases are, very properly as it seems to me, classified under reed pipes, the sorts of reeds described being of great variety. The model pictured at the head of the section, for the study of membranous reeds, is certainly, as I think will be admitted by anyone who has made one, a very convincing demonstration of the mode of action of the larynx. Professor Scripture's elastic cushions are certainly to be classified as reeds.

ARTHUR GORDON WEBSTER.

CLARK UNIVERSITY, May 17, 1901.

THE NEW COMET.

TO THE EDITOR OF SCIENCE: In SCIENCE for May 3d, page 717, appears an announcement of the discovery of the new comet, to which is added a section, stating that Professor Frost, of the Yerkes Observatory, had observed the comet on the morning of April 27th, just before sunrise. The last number of the *Astronomical Journal* also contains a similar statement, saying the comet was seen by him 20 minutes before sunrise, half an hour afterwards, and 15° north of the sun.

Here at the Naval Observatory two of the computers, and also I, myself, hunted diligently for the comet, both in the morning and evening, for several days after the receipt of the first telegram, and until we had positive information on the direction of motion.

Now that a set of elements of the comet has been received, it is perfectly clear that whatever Professor Frost sighted on April 27th, it was not the comet. On that day the object was 13° *south* of the sun, and very close to it in right ascension.

Moreover, as seen from the Yerkes Observatory, it would not rise until about 40 or 45 minutes after the sun, as any one can easily demonstrate by computing the place of the comet for that day, the semi-diurnal arc for it and the sun, for Yerkes Observatory, and take the difference between those two quantities.

GEORGE A. HILL.

NAVAL OBSERVATORY, WASHINGTON, D. C., May 16, 1901.

THE TEACHING OF PHYSIOLOGY IN THE PUBLIC SCHOOLS.

ABOUT two years ago I wrote a letter for SCIENCE concerning the text-book in physiology adopted by the State Board and used throughout the public schools of Kansas. Much dissatisfaction has been expressed by the more intelligent teachers of the State, but there is, nevertheless, no redress—the book must be used as a text in every school in the State.