

## A PIONEER OF SCIENCE.

BY W. H. HALE.

Of the men who laid the foundations of scientific research in this country few indeed remain. The generation contemporary with Agassiz and Guyot, Joseph Henry, the Rogerses, T. Romeyn Beck, Morse and Hitchcock, has passed away; but a few of their associates still linger. Such a one I met not long ago secluded from the busy world in his quiet village home; a man who shares with the veteran geologist James Hall the distinction of having aided by his presence in organizing that early association of geologists at Philadelphia in 1840 out of which afterward sprang the American Association for the Advancement of Science.

Martin H. Boyé, M.D., was born at Copenhagen, Denmark, December 6, 1812. His father was a chemist and superintendent of a large pharmaceutical establishment and was superintendent of the Royal Porcelain Manufactory at Copenhagen. In 1831 he was admitted to the University of Copenhagen, where he passed with distinction the philological and philosophical examinations. He afterward entered the Polytechnic School, studying analytical chemistry and physics under Oersted, Zeise and Forchhammer, and he graduated from that institution in 1835.

In 1836 he came to New York, where he remained till 1837, when he removed to Philadelphia and attended the lectures of Dr. Robert Hare, professor of chemistry in the medical department of the University of Pennsylvania, assisting him also in his laboratory. In connection with Dr. Forman Leaning, he translated into English several essays on belles-lettres and chemical subjects. In 1838 he was appointed assistant geologist and chemist in the first geological survey of Pennsylvania under Prof. Henry D. Rogers, whom he accompanied on a tour of investigation through the anthracite coal regions.

The work assigned to Mr. Boyé was the exploration of the South Mountain or Lehigh Hills, a continuation of the Jersey Highlands, which extends from Easton to Reading, through the counties of Northampton, Lehigh and Berks, and the preparation of a geological map of this region. His name is mentioned in the report of the geological survey at this early date.

Young Boyé was thrown into close relations with the distinguished scientific family of Rogers. In 1839 and 1840 he was associated with Robert E. and James B. Rogers in analyzing limestone, coal, iron ores, etc., for the geological survey, as published in the reports. While engaged in these analyses he discovered, in conjunction with Prof. Henry D. Rogers, a new compound of platinum chloride with nitric oxide, which was reported to the American Philosophical Society, and in January, 1840, he was elected to membership in that society, being at that time the youngest member of the society in years, as he is now the oldest in membership, though not now the oldest in years.

A few months later, in April, 1840, about a score of scientists met at Philadelphia and organized the American Association of Geologists, subsequently renamed the American Association of Geologists and Naturalists, out of which, in 1848, was formed the American Association for the Advancement of Science.

The importance of this movement can hardly be overestimated, as the American Association has always been true to its name, a powerful factor in advancing science.

This initial meeting in 1840 is, therefore, one of especial interest to scientists, and indeed, to all. Of that little company who met at Philadelphia, young Boyé, then only twenty-seven years old, was probably the youngest. Besides himself and James Hall, one other member survived till June 13 of the present year, when he died at Detroit. This was Bela Hubbard, who was already connected with the geological survey of Michigan, and who, in company with Douglas Houghton, made the journey from Michigan to Philadelphia by stage, consuming a week upon the route. Edward Hitchcock, of Amherst, was president, and Lewis C. Beck, of Albany, secretary of the association. No official record of the first members can be found, but the recollection of the survivors gives the following additional names: Prof. Vanuxem, Henry D. Rogers, Conrad, Charles B. Trego, and Alexander McKinley, of Pennsylvania; Emmons and Mather, of New York; James C. Booth, of Delaware; Dr. Hayden, of Virginia; and, probably, Prof. Johnson, of Philadelphia. This list was prepared by Bela Hubbard a few months before his death and revised by Dr. Boyé. Possibly, Dr. Charles E. West, of Brooklyn, was present at this meeting; if not so, he soon afterward became a member.

In the summer of the same year, Mr. Boyé in connection with J. J. Clark Hare discovered the first of the violent explosives, perchloric ether, which he proved was ten times as powerful as gunpowder. He also found a remedy against its unexpected explosion by dilution with alcohol. He was thus in an important sense a pioneer in the vast field of smokeless gunpowder, which has recently been so diligently investigated.

In the summer of 1841 he resumed field work, ex-

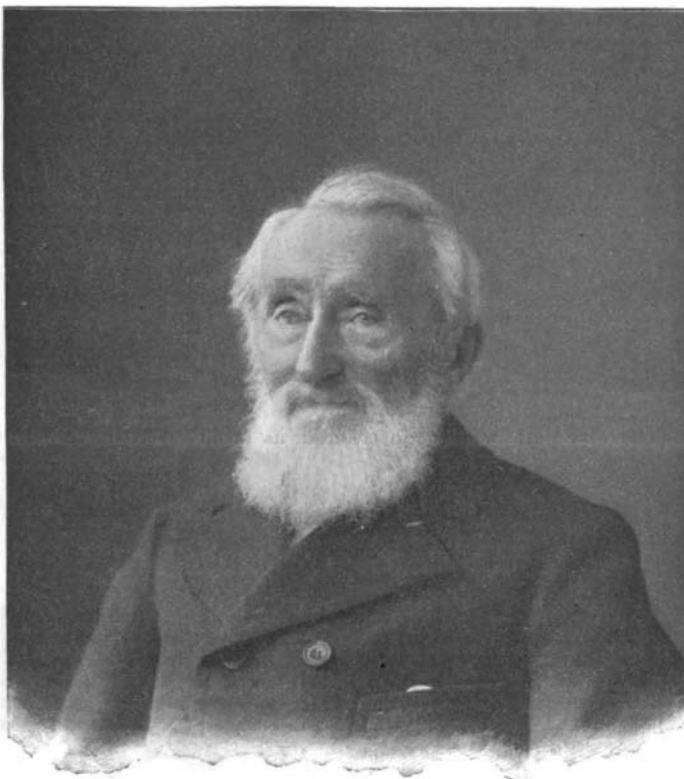
amining the bituminous coal regions along the Kiskimetas and Allegheny Rivers and Beaver Creek.

In 1842-44 he attended the regular course of medical lectures at the University of Pennsylvania, at the same time conducting a chemical laboratory in connection with Prof. James C. Booth, and wrote for Booth's Chemical Encyclopedia the article on "Analysis," and others, and performed many scientific analyses. In connection with Prof. Booth, he read a paper on "The Conversion of Benzoic into Hippuric Acid," at the one hundredth anniversary of the American Philosophical Society.

In 1844 Mr. Boyé graduated at the University of Pennsylvania as a doctor of medicine, but he never practiced that profession. At the same time the collegiate department of the university conferred on him the honorary degree of master of arts. He is now by many years the oldest surviving recipient of an honorary degree from that university.

In 1845 Dr. Boyé was elected professor of natural philosophy and chemistry in the Central High School, of Philadelphia, and held this position till February, 1859. Of his work at this time, one of his pupils, now president of Lehigh University, Dr. Thomas M. Drown, writes that Dr. Boyé first inspired in him a love for chemistry. During this period Dr. Boyé wrote a treatise on "Pneumatics, or the Physics of Gases" (published 1856; also a small introductory treatise on "Chemistry, or the Physics of Atoms"); he also delivered many public lectures.

The extraction of oil from cotton seed had already been undertaken, but the product was almost black and very thick. In 1845 he invented a process of re-



MARTIN H. BOYÉ, M.D.

fining, which produced a bland and colorless oil adapted for cooking or for salad dressing. Toilet soap made from it equaled or surpassed the best castile. In 1847-48 he began the manufacture and refinement of this oil on a large scale. This oil, some of which was preserved from 1848, and some was manufactured for the occasion, subsequently gained the award of a first premium at the Centennial Exposition of 1876, at Philadelphia.

His early work in the field gave Dr. Boyé a practical familiarity with the picturesque region of eastern Pennsylvania, and enabled him to select for the home of his mature and declining years one of the loveliest nooks in that terrestrial Eden: he calls his home "Keewaydin," a name of the northwest wind from "Hiawatha." In 1859 he removed from Philadelphia to Coopersburg, Lehigh County, about nine miles south of Bethlehem, where he has ever since resided, engaged in what Washington termed the most noble and useful avocation of man—agriculture.

KRAUS, a German chemist, has according to the Pharmaceutical Era, investigated the extent and purpose of the rise of temperature at the time of flowering within the spathe of various species of plants. In one "he found this elevation to take place only in the daytime, the maximum attained being 38.5° C., or 11.7° above that of the air." In another "the period of maximum elevation is more variable, but it is never in the night. In this order the seat of the elevation of temperature is not the reproductive organs themselves, but the club-shaped appendix to the inflorescence, and it is accompanied by a rapid consumption of starch and sugar. All the plants in which this phenomenon occurs are entomophilous [frequented by insects], and Dr. Stahl sees in it a contrivance for attracting insects to assist in pollination."

## How the Supreme Court Decides Cases.

Justice Harlan, of the Supreme Court of the United States, at a banquet in Cincinnati, O., October 3, gave the following interesting account of the method pursued by that body in deciding cases before it:

"In my intercourse with the members of the bar I have found, to my great surprise, that the impression prevails with some that cases, after being submitted, are divided among the judges, and that the court bases its judgment in each one wholly upon the report made by some one judge to whom that case has been assigned for examination and report. I have met with lawyers who actually believed that the opinion was written before the case was decided in conference, and that the only member of the court who fully examined the record and briefs was the one who prepared the opinion.

"It is my duty to say that the business in our court is not conducted in any such mode. Each justice is furnished with a printed copy of the record and with a copy of each brief filed, and each one examines the records and briefs at his chambers before the case is taken up for consideration. The cases are thoroughly discussed in conference—the discussion in some being necessarily more extended than in others. The discussion being concluded—and it is never concluded until each member of the court has said all that he desires to say—the roll is called, and each justice present and participating in the decision votes to affirm, reverse or modify as his examination and reflection suggests. The chief justice, after the conference, and without consulting his brethren, distributes the cases so decided for opinions. No justice knows, at the time he votes in a particular case, that he will be asked to become the organ of the court in that case; nor does any member of the court ask that a particular case be assigned to him.

"The next step is the preparation of the opinion by the justice to whom it has been assigned. The opinion, when prepared, is privately printed and a copy placed in the hands of each member of the court for examination and criticism. It is examined by each justice and returned to the author, with such criticisms and objections as are deemed necessary. If these objections are of a serious kind, affecting the general trend of the opinion, the writer calls the attention of the justices to them, that they may be passed upon. The author adopts such suggestions of mere form as meet his views. If objections are made to which the writer does not agree, they are considered in conference and are sustained or overruled as the majority may determine. The opinion is reprinted so as to express the final conclusions of the court and is then filed.

"Thus, you will observe, not only is the utmost care taken to make the opinion express the views of the court, but that the final judgment rests, in every case decided, upon the examination by each member of the court of the record and briefs. Let me say that during my entire service in the Supreme Court I have not known a single instance in which the court has determined a case merely upon the report of one or more justices as to what was contained in the record and as to what questions were properly presented by it. When you find an opinion of the court on file and published, the profession have the right to take it as expressing the deliberate views of the court, based upon a careful examination of the records and briefs by each justice participating in the judgment."—The Literary Digest.

## Tetanus Antitoxin.

In the Deutsche Medicinische Wochenschrift, says Lancet, Prof. Behring informs the profession that the Hoechst factory, which also produces the diphtheria antitoxin, is authorized to sell the new tetanus antitoxin. The production will be placed under state control in the government laboratory directed by Prof. Ehrlich, each bottle bearing the official stamp. The remedy is to be issued in two forms: 1. In dry preparation, 1 gramme containing 100 normal units. The bottles will hold 5 grammes (=500 units), which must be dissolved for use in 45 grammes of water. This dose is sufficient to treat tetanus in men as well as in horses. Intravenous injections are of a prompter action than subcutaneous. The surgical treatment is, however, not to be neglected. 2. A solution of antitoxin, 1 c. c. of which contains 5 normal units. It will be issued in bottles of 5 c. c., and from 0.5 to 5.0 of this fluid are to be injected when the outbreak of tetanus is expected. The dose will depend upon the time which has elapsed since the injury. For prophylactic purposes—for instance, before the performance of castration in animals—0.2 gramme is sufficient. To avoid putrefaction a small quantity of carbolic acid has been added to each bottle of the remedy. The dry preparation, which remains sterile in well closed bottles, contains no antiseptic. Dr. Behring points out that the doses may, perhaps, become modified after clinical experience. It will be the task of veterinary medicine to determine the right doses.