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AMERICAN CHEMICAL SOCIETIES.¹

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There are many ways in which a man may endeavor to serve his age and generation by devotion to the science of chemistry, and surely, not the least important of these is the labor which has for its object the stimulation and development of our great national chemical society, an organization which has been one of the most potent factors in the growth and progress of the science.

Among the prime requisites for the success of any organization are: (1) community of interest, and (2) an enthusiastic and intelligent cooperation on the part of the membership. That we all have the same interests at heart—the advancement of chemistry, and the development of our Society for this purpose—is true beyond any shadow of doubt. The needed cooperation on the part of the membership has been manifest in a high degree. Those who were fortunate enough to be present at our recent meeting in Toronto will, I know, bear testimony to the fine enthusiasm and *esprit de corps* evident. That is the spirit that should permeate the entire organization and penetrate to all corners of our country wherever our members are located, for it is certain to bring a rich harvest of growth and power to the Society.

In the rapid progress of our Society during the past few years, it has not been an easy matter to keep the members properly informed as to its exact condition and the lines of contemplated development, and yet without such information intelligent cooperation is difficult.

For any adequate comprehension of the requirements of an organization of the size and character of the American Chemical Society, not only is a searching scrutiny of its own history for the last thirty-three years neces-

¹ Presidential address delivered at the Chicago Meeting of the American Chemical Society, January 1, 1908.

sary, but also a careful consideration of past and present conditions of chemical organization in this country. On such knowledge as the foundation, it should be possible to base a fairly trustworthy judgment as to the most promising lines of development.

I have, therefore, made as thorough an examination as my time would permit of the history of chemical organizations in this country, partly that we might benefit by the experience of others, and partly to gather facts concerning other existing chemical organizations in the United States, in the earnest hope that a way may later open for the union of all American chemical organizations in one great society or federation.

It seemed to me that the subject was one of sufficient interest and importance to constitute an acceptable presidential address, for the next few years will be critical ones for us, and the more familiar our members are with such matters the more intelligently will they be able to assist our Council. Such a topic enjoys the obvious merit of appealing to every member present, an advantage which, I fear, would scarcely pertain to a text selected from my own chosen field of synthetic organic chemistry.

In the early history of our country, when it was striving to win for itself a place among the nations, there was little opportunity for the pursuit of science for science's sake. The facilities for acquiring chemical knowledge were necessarily very meagre, what little training there was, being given mainly in medical schools. Chairs of Natural History and Physical Science were generally held by physicians, for it was felt that their education more nearly fitted them for such work. Thus chemistry in the early days was largely a side issue, being taught often with *materia medica*. It is particularly interesting to me as a Columbia man to find that chemistry was first recognized as a branch of the curriculum of medical study at King's College (now Columbia) in 1767. In 1774, the Right Rev. James Madison was Professor of Chemistry and Natural Philosophy at Williams and Mary. The first separate Chair of Chemistry at a non-medical institution was established October 1, 1795, at the College of New Jersey (now Princeton). It was filled by Dr. John MacLean, from whom the elder Silliman received his early chemical instruction.

Although the latter half of the 18th Century was the period of Franklin, Rumford and Priestley, when we recall that this was also the period of our war for independence, it is not surprising that progress in science was relatively inconsiderable.

It was natural in these early years of science in America that what scientific organizations there were should be general in their character, as scarcely any individual science, with the possible exception of medicine, was strong enough to stand alone. It is appropriate, therefore, that a

few words be said about these general scientific societies before passing on to those strictly chemical.

The first of these general societies was the American Philosophical Society, founded by Benjamin Franklin, at Philadelphia, in the year 1743, and recognized by Provincial Charter in 1769. Franklin was its president from the date of its charter until his death in 1790. The first volume of its *Transactions* appeared in 1769 and contained a paper by Dr. DeNormandie on "An Analysis of the Chalybeate Waters of Bristol in Pennsylvania," which appears to be the first chemical analysis ever published in this country; and what are probably the first papers published by Priestley on this side of the water, entitled "Experiments and Observations Relating to Analysis of Atmospheric Air" and "Generation of Air from Water." This venerable association is still active and vigorous, its aim being to cover all branches of so-called natural science.

On May 4, 1780, the American Academy of Arts and Sciences was incorporated at Boston.

In 1799, the Connecticut Academy of Arts and Sciences was established at New Haven and incorporated by legislative enactment.

The Literary and Philosophical Society of New York, founded in the early part of the 19th Century, had but a brief existence, and published but a single volume of *Memoirs* (containing one paper on chemistry).

On April 20, 1816, the New York Lyceum of Natural History was incorporated. In 1876, it changed its name to the New York Academy of Sciences.

At about the same time, the Philadelphia Academy of Natural Sciences was established, the first volume of its journal appearing in 1817.

These early organizations were rapidly augmented by the establishment of various scientific associations and academies in other parts of the country, and most of our great cities now have one or more of this class.

The first of these general scientific organizations to wield more than a merely local influence and power was the American Association for the Advancement of Science. The original progenitor of this association was the American Association of Geologists, founded in 1840 by those engaged in the geological surveys of various states. It later became the Association of American Geologists and Naturalists, which body, at its meeting in Boston, 1847, resolved to enlarge its sphere of action to include physics, chemistry, astronomy, and the allied physical sciences, and thus began its enlarged existence in 1848 as the American Association for the Advancement of Science.

In most of these general organizations, it was customary to subdivide science more or less closely into sections. At the outset, chemistry was grouped frequently merely under the general section of natural sciences, then with physics or *materia medica*, and finally it was found necessary

to establish separate sections for chemistry. In the American Association for the Advancement of Science a chemical sub-section was established at the Hartford meeting, August 17, 1874, with S. W. Johnson as Chairman, and F. W. Clarke as Secretary. This became a full-fledged section (Section C) at the Montreal meeting of the Association, 1882, with H. C. Bolton as presiding officer and Alfred Springer as secretary.

CHEMICAL SOCIETY OF PHILADELPHIA.

The first organization devoted specifically to chemistry was the Chemical Society of Philadelphia, founded in 1792. This was probably the earliest chemical organization in the world, as it was born forty-nine years before the first European chemical society (Chemical Society of London, 1841). Priestley appears to have been one of its active members. In 1801-'02 its president was James Woodhouse, who was at the time Professor of Chemistry in the Medical Department of his *alma mater*, the University of Pennsylvania. This Chair had been held by Dr. James Hutchinson, and on his death, in 1793, was offered to Dr. Joseph Priestley, who had but just arrived from England. Priestley, however, preferred the quiet and retirement of Northumberland, and Dr. Woodhouse was then elected to the position. The most important communication presented to this society was that announcing the discovery of the oxyhydrogen blow-pipe. It was made on December 10, 1801, by Robert Hare, Jr., then but twenty years old, who subsequently became Professor of Chemistry in the Medical School of the University of Pennsylvania. Just when this society ceased to exist is uncertain, but it appears to have been about 1803.

COLUMBIAN CHEMICAL SOCIETY.

It was succeeded by the Columbian Chemical Society of Philadelphia, founded August, 1811, by "a number of persons desirous of cultivating chemical science and promoting the state of philosophical inquiry." Its first president was James Cutbush and its membership list included sixty-nine honorary and thirteen junior members. Vol. I of its *Memoirs* appeared in 1813. As "patron" of this society appears the name of Hon. Thomas Jefferson, Esq., who had been president of the American Philosophical Society for many years, relinquishing it finally to become the President of the nation. Seventeen months before the founding of this society, he had retired from the presidency of the United States and was living at his country seat in Monticello. James Cutbush was at the time Professor of Natural Philosophy, Chemistry and Mineralogy at St. John's College. From June 1820 until his death, December 15, 1823, he taught at the U. S. Military Academy, West Point.

The constitution of this society provided in addition to other officers an "orator," who should deliver "an oration on some chemical subject

within two months after the commencement of the medical lectures in the University of Pennsylvania, in each year." As the *Memoirs* of the society contain no "oration," it has been suggested that the incumbent's efforts were not satisfactory. The roll was called at the opening and closing of every meeting and all absentees were fined twelve and a half cents each. Any member elected to office and declining to serve was fined one dollar. Once in each month the society appointed some member to read an original chemical essay, "for neglect of which, the member so appointed shall be fined one dollar." Candidates for admission were required to "read an original essay on some chemical subject."

Among its members were, Dr. Benjamin Smith Barton, of the University of Pennsylvania, sometimes called "the father of American natural history;" Dr. Archibald Bruce, of Columbia College, founder of the *American Mineralogical Journal*; Dr. John Griscom, "the acknowledged head of all teachers of chemistry in New York City" for more than thirty years; Robert Hare, of the University of Pennsylvania; Dr. David Hosack, of Columbia College, founder of the first public botanical garden in the United States (1801); James Madison, President of the United States; Dr. John Maclean, first Professor of Chemistry at the College of New Jersey; Hon. Samuel L. Mitchell, Professor of Chemistry and Natural History at Columbia College and a United States Senator; Dr. Benjamin Rush, of the University of Pennsylvania, who was regarded by Benjamin Silliman as "undoubtedly the first Professor of Chemistry in America," his appointment dating August 1, 1769; Benjamin Silliman, Professor of Chemistry at Yale; and many noted foreign chemists. This was the first chemical society of a truly national character. Unfortunately, it survived but a few years.

DELAWARE CHEMICAL AND GEOLOGICAL SOCIETY.

The Delaware Chemical and Geological Society was organized at Delhi, Delaware County, N. Y., September 6, 1821. It is stated that it was composed of "between forty and fifty well-informed and respectable inhabitants" of Delaware County. Its first quarterly meeting was held at Edgerton's Hotel in Delhi Village, with Charles A. Foote as president. It, too, was short-lived.

So far as the writer is aware, there were no important chemical societies in existence, certainly none of national influence, between this time and the founding of the Manufacturing Chemists' Association of the United States (1872) and of the American Chemical Society (1874). Original communications in chemistry were presented before the various philosophical societies, academies and institutes, and published in their *Transactions*, in the *Journal of the Franklin Institute* and, chiefly, in *Silliman's Journal*. With the appearance of the American Association for the Ad-

vancement of Science upon the scene (1848), the chemists rallied more and more strongly to its support until it had enrolled on its membership list a large number of the leading chemists of the country and its chemical section (Section C) was unquestionably the most powerful organization of chemists then in America.

MANUFACTURING CHEMISTS' ASSOCIATION OF THE UNITED STATES.

On May 29, 1872, the Manufacturing Chemists' Association of the United States was organized at the Astor House, New York City, Mr. Thomas S. Harrison, of Philadelphia, presiding. Manufacturers of chemicals whose annual product is at least \$50,000 in value are eligible for membership. Its objects are to protect its members against unwise legislation and unjust freight discrimination, and to promote and aid any matter of general or special interest in the chemical industries. Its membership at present comprises forty-one representative corporations. Annual meetings are held in cities selected by vote. This brings me up to the founding of our own

AMERICAN CHEMICAL SOCIETY.

In the *American Chemist* for April, 1874, there was published a letter from Dr. H. C. Bolton, of Columbia College, entitled: "Centennial of Chemistry, 1774-1874," in which he referred to the many notable chemical discoveries of the year 1774, as the fruit of the labors of such men as Scheele, Lavoisier, Priestley, Cadet, Bergmann, and others. As the discovery of oxygen by Dr. Joseph Priestley on August 1, 1774, resulted in the overthrow of the Phlogistonists and the establishment of chemistry on its present basis, the writer points out that the year 1774 may well be regarded as the birth year of modern chemistry, and suggests that it "would be an agreeable event if American chemists should meet on the first day of August 1874, at some pleasant watering-place, to discuss chemical questions, especially the wonderfully rapid progress of chemical science in the past one hundred years." This suggestion met with the hearty approval of the editors of the *American Chemist* and they requested all chemists interested in the matter to send in their views at once. Among other letters, one was received from Miss Rachel L. Bodley, Professor of Chemistry at the Woman's Medical College, of Pennsylvania, which contained the following: "I made a pilgrimage last August to the grave of Priestley in Northumberland, Pennsylvania, and was deeply impressed by the locality, its associations, and its charming surroundings. My proposition is, therefore, that the centennial gathering be around this grave, and that the meetings, other than the open air one on the cemetery hilltop, be in the quaint little church built by Priestley, where might be exhibited the apparatus devised by the great scientist and used in his memorable experiments."

At a meeting of the Chemical Section of the New York Lyceum of Natural History, May 11, 1874, on motion of Dr. H. C. Bolton, the following resolutions were adopted: "WHEREAS, the discovery of oxygen by Priestley on August 1, 1774, was a momentous and significant event in the history of chemistry, being the immediate forerunner of Lavoisier's generalizations on which are based the principles of modern chemical science; and, WHEREAS, a public recognition of the one hundredth anniversary of this brilliant discovery is both proper and eminently desirable; and WHEREAS, a social reunion of American chemists for the mutual exchange of ideas and observations would promote good fellowship in the brotherhood of chemists; therefore, RESOLVED, that a committee of five be appointed by the Chair, whose duty it shall be to correspond with the chemists of the country with a view to securing the observance of a centennial anniversary of chemistry during the year 1874." The committee appointed consisted of Messrs. Bolton, Chandler, Wurtz, Leeds and Seeley. The suggestion of Miss Bodley that the meeting be held at Northumberland met with general approval, and the above committee having made all necessary preparations, issued the call, with the result that the chemists of the country assembled at Northumberland on July 31, 1874, where they were received and most hospitably entertained by the direct descendants of Priestley. Altogether about eighty chemists attended the celebration. The first session was held in the Public School building and Professor C. F. Chandler was chosen president. Various historical addresses were presented and congratulatory cablegrams exchanged with the chemists of Birmingham; who were to unveil a statue to Priestley the following day. Some of Priestley's original letters were read, and a memorial address by Henry Coppee, LL.D., president of Lehigh University, was delivered at the grave.

At the afternoon session on July 31st, Professor Persifer Frazer "proposed the formation of a chemical society which should date its origin from this centennial celebration," since America had "not a single society to represent the chemical thought of the country." This was opposed by Professor J. Lawrence Smith, chiefly on the ground that there were "already two great organizations, the American Scientific Association (*sic*) and the American Academy of Sciences, which undertook to embrace in their proceedings everything connected with chemical research." Others expressing themselves as of similar opinion, it was finally resolved "that a committee of five be appointed from this meeting to co-operate with the American Association for the Advancement of Science at their next meeting, to the end of establishing a chemical section on a firmer basis." The committee appointed consisted of Messrs. Bolton, Silliman, Smith, Horsford and Hunt.

The attitude of Dr. J. Lawrence Smith towards the question will be

better understood when it is recalled that he was president of the American Association for the Advancement of Science two years before (1872). At the Portland meeting of this Association the following year (1873), a separate heading in the physics section was given for chemistry and more papers (six) were presented in that science than there had been in both physics and chemistry (five) the year before. At the close of the meeting, an informal gathering of chemists was held (August 26), with Professor S. A. Lattimore as chairman, at which resolutions were adopted asking for the organization of a chemical sub-section of the Association. These resolutions were favorably received, and the chemists of the Association, cooperating with the committee appointed at the Northumberland celebration, organized a chemical sub-section at the Hartford meeting, August 17, 1874. As already stated, in the year 1882 this became a section, with Dr. Bolton as its first chairman.

The formation of a chemical sub-section by the American Association for the Advancement of Science did not, however, fully satisfy many of those who were present at Northumberland. These chemists felt that what was needed was an independent American chemical society, which should unite in one active, aggressive organization the chemists of the country, and that only through such an organization could the progress of chemistry be properly stimulated and hastened. This need was felt most keenly in New York City, and led finally to a meeting on January 22, 1876, at the home of Dr. C. F. Chandler, at which a committee was appointed, consisting of Messrs. Chandler, Habirshaw, Endemann, Alsberg, Morton, Walz, Hoffmann and Casamajor, to attend to the preliminaries of organization. A circular was prepared and mailed to about one hundred chemists residing in the vicinity of New York City, suggesting the formation of a chemical society in New York. The replies were so numerous (forty) and encouraging that it was decided to attempt the formation of a national instead of a purely local society, and a circular letter was sent out to chemists in all parts of the country. Sixty chemists outside of New York City signified their desire to join. The first meeting for organization was held April 6, 1876, at the New York College of Pharmacy, with Dr. Chandler as Chairman, Isidor Walz as Secretary, and thirty-five chemists in attendance. Drs. Bolton and Egleston both thought the time inopportune for such a movement, as both the New York Academy of Sciences and the American Association for the Advancement of Science had chemical sections. Nevertheless organization was proceeded with, a constitution and by-laws adopted, and at an adjourned meeting, April 20th, Dr. John W. Draper was elected president. The first regular meeting after organization was held May 4, 1876, with Vice-President Chandler in the Chair, thirty members and fifteen visitors being present. The first paper read was "On the Determination of the

Relative Effectiveness of Disinfectants," by Dr. H. Endemann. Arrangements were made with the editors of the *American Chemist* to publish the Proceedings of the Society and to supply the members with reprints.

On June 16, 1876, the Society gave a dinner at the Union League Club of Philadelphia, to the foreign chemists officially connected with the Centennial Exposition, which was attended by about seventy chemists.

On November 16, 1876, in Chickering Hall, New York City, Dr. Draper delivered his presidential address, on "Science in America," before a large and distinguished audience. At the close of the year, the membership of the Society was about 230. In November, 1876, the Society was incorporated in New York State. The first report of the librarian (Casamajor), published at the close of 1878, showed that the library then contained 344 volumes. On March 6, 1879, the publication of the *Journal of the American Chemical Society* began.

By the close of the year 1880, the Society was \$900 in debt, with nominal assets in the shape of uncollected dues amounting to about \$1,000. The publication of the *Journal* was therefore temporarily suspended and the debt liquidated by personal subscription. During this year there was frequently no quorum (fifteen) at the meetings. The *Journal* for 1881 (Vol. III) covered only 189 pages and contained twenty-seven original articles, eighteen of which were contributed by three authors, Leeds, Stebbins and Casamajor. In 1882, the lack of original material for the *Journal* appears to have been felt even more than the lack of funds. In 1884, it was found necessary to reduce the quorum from fifteen to ten. The *Journal* for 1888 (Vol. X) contained but ten original papers, and the following year the Society appeared almost moribund. There were but few papers submitted for the *Journal* and not enough money to publish even these. Personal subscriptions were again necessary to meet expenses. It was apparent to all that a radical change in policy was necessary or the organization would inevitably succumb. The fact that the Society was chartered in New York and all its meetings held in New York City, rendered the Society essentially a local one, in spite of the fact that the president and other officers were frequently selected from non-residents. The direct outcome of this condition of affairs was a steadily increasing discontent on the part of chemists in other parts of the country, resulting in a withdrawal of their interest and support, and the New York members, upon whom the burden was falling with ever-increasing severity, were rapidly becoming discouraged by this lack of support. As a natural corollary, there had begun a movement for the establishment of another chemical organization which should be more truly national.

At the meeting of Section C in Cleveland, in 1888, a committee was appointed on the formation of a national chemical organization. At the Toronto meeting, the next year (1889), this committee, after conferences

with committees appointed by the American Chemical Society, Association of Official Agricultural Chemists, Washington Chemical Society, and the Chemical Section of the Franklin Institute, recommended the establishment of a national organization. As the result of this report, the constitution of the American Chemical Society was revised so that an advisory council, local sections, and migratory meetings were authorized. The headquarters, however, remained in New York City. The first general meeting outside of New York was held at Newport, R. I., August 6-7, 1890, and was a great success. It was followed by the organization of the Rhode Island Section, the first of the local sections, which was duly chartered the following year. At the second general meeting, held in Philadelphia, December 30-31, 1890, a conference occurred of committees representing various chemical organizations to bring about consolidation, the basis of which was to be the union of all as the "American Chemical Society," the present New York organization to become a local section. At the third general meeting, at Washington, August 17-18, 1891, as the upshot of a similar conference of committees, it was resolved to unite on the above basis. The organizations represented at this conference were: The American Chemical Society (290 members), Section C of A. A. A. S. (200 members), Assoc. Official Agr. Chemists (75 members), Chemical Section of the Brooklyn Institute (75 members), Chemical Society of Washington (70 members), Chemical Section of the Franklin Institute (70 members), Chemical Society of the University of Michigan (60 members), Louisiana Sugar Chemists' Association (52 members), Cincinnati Chemical Society (29 members), and the Manufacturing Chemists' Association of the United States. A complete reorganization of the American Chemical Society followed, and a further revision of its constitution, and on April 29, 1892, the New York organization became the New York Section of the American Chemical Society. Just one month before this date, the "Chemical Society of Cincinnati and vicinity," organized December 19, 1890, was chartered as the Cincinnati Section. The Chemical Society of Washington, an organization of chemists working for the United States Government, and founded in 1884, became a local section the following year, retaining at the same time its original title. In 1893, Dr. Hart's *Journal of Analytical and Applied Chemistry* was consolidated with the *Journal of the American Chemical Society* and Dr. Hart appointed editor. The condition of our *Journal* at the time was not very encouraging, for when he took charge there were but two papers ready for publication, with five numbers of the *Journal* in arrears.

The seventh General Meeting occurred in this city (Chicago), August 21-26, 1893, in connection with the World's Chemical Congress of the Columbian Exposition. At the Buffalo meeting, August 21-22, 1896, the present plan of holding joint meetings with Section C of the American

Assoc. for the Advancement of Science was agreed upon. By its terms, the first two days are devoted to the American Chemical Society, with the exception of sufficient time on the first morning for Section C to organize and in the afternoon for the address of their vice-president, the rest of the meeting being then given up to Section C.

At the close of the year, 1897, the Society arranged with Dr. A. A. Noyes to take over the publication of the *Review of American Chemical Research*, and Vol. III of this *Review* was published with the 1897 *Journal*. The publication of abstracts and patents had been undertaken by the Society years before, beginning with Vol. I, No. 4, but it finally ceased with the January number of Vol. XVI (1893).

In 1902 associate membership was abolished. This attempted classification of our members was partly responsible for the separation from us of the industrial chemists and electrochemists.

The first recognition of the growing strength and importance of the various branches of chemistry was made in 1904 when the general meetings were for the first time held in sections.

This year, as you know, we have taken a great stride in advance by the successful publication of *Chemical Abstracts*, superseding the *Review of American Chemical Research*. In spite of the necessary increase in dues from \$5.00 to \$8.00, we are gaining new members more rapidly than ever. Within the past year three new local sections have been chartered, Syracuse, St. Louis and Wisconsin, and others are in process of formation.

It was hoped at the time the American Chemical Society was reorganized that all existing chemical societies would come into the fold and that the American Chemical Society would be the one organization to include all the chemists of the country. Unfortunately, this has not yet been realized. Not only did some of the chemical societies then existing fail to come in, but other separate and independent organizations have since arisen. A brief consideration of these is necessary to any proper understanding of existing conditions. I cannot, of course, take up those of purely local character, although some of them (for example, those at Detroit, Cleveland and elsewhere) are strong in numbers and influence. We hope that they will all ultimately form new local sections of our Society or unite with existing local sections. Nor is there time to take up the consideration of chemical sections of academies of science or of scientific institutes, although some of them exert a powerful influence locally (as the chemical section of the Franklin Institute, for example).

It is more important to consider those chemical societies which possess a more national character, pointing out the reasons for their establishment, the particular field covered, and their present strength in numbers and influence. The most important of the chemical organizations established

since the founding of the American Chemical Society, taking them up in chronological order, are as follows:

1880, Assoc. of Agricultural Chemists (later the Assoc. of Official Agricultural Chemists).

1894, New York Section, Society of Chemical Industry.

1898, New England Association of Chemistry Teachers.

1900, New York Section, Verein Deutscher Chemiker.

1902, American Electrochemical Society.

1904, Western Assoc. of Technical Chemists and Metallurgists.

1906, Society of Biological Chemists.

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS.

The condition of agricultural chemical work in the United States in 1880 has been described by Dr. Wiley as "chaotic." There was no unity of purpose, action or methods, no standard of comparison or reference. The great differences in analytical methods led to constant wrangling and litigation between buyer and seller.

It was to put an end to this state of affairs that the Hon. J. T. Henderson, Commissioner of Agriculture for Georgia, at the suggestion of Mr. H. J. Redding, issued a call for a convention of agricultural commissioners and chemists for the purpose of securing uniformity in analytical methods. This convention was held in Washington, July 28, 1880, with Judge Henderson as Chairman and A. R. Ledoux as Secretary, the chief topic considered being fertilizer analysis. It was further decided to form a division of the sub-section of chemistry in the American Association for the Advancement of Science and to hold the next meeting with this Association. This joint meeting occurred in Boston, August 27, 1880, and a committee of three was there appointed to secure the formation of a permanent chemical section in the American Association with agricultural chemistry as a sub-section. The third meeting of the Association, held in the room assigned to the chemical sub-section of the American Association, Cincinnati, August 18, 1881, transacted its business separately, but read its papers before the American Association.

After the Cincinnati meeting, the interest of agricultural chemists in collaboration seemed to die out, due apparently to the difficulty of harmonizing the conflicting interests of the trades chemists and official chemists. After the lapse of three years, Judge Henderson again called a meeting, which was held at Atlanta, Ga., May 15, 1884, and once more discussed the unification of analytical methods. At the next meeting, held in Philadelphia, September 8-9, 1884, in conjunction with the American Association, it was decided to form a separate and independent organization instead of a sub-section of the American Association, and on September 9th, the Association of Official Agricultural Chemists came into existence.

At the eleventh annual meeting, Washington, August 23, 1894, the Society of Leather Chemists was absorbed and a reporter on tannin appointed.

According to the constitution of this Association, its objects are (1) to secure uniformity and accuracy in the methods, results, and modes of statements of analysis of fertilizers, soils, cattle foods, dairy products, and other materials connected with agricultural industry; and (2) to afford opportunity for discussion of matters of interest to agricultural chemists. Its voting members must be analytical chemists connected with the U. S. Dept. Agriculture, or with any state or national agricultural experiment station or agricultural college, or with any state or national institution or body charged with official control of materials named in (1) above. Other analytical chemists are permitted to attend meetings and participate in the discussions but not to vote or offer motions. Referees are appointed to prepare and distribute samples and standard reagents and to tabulate and present results before the Association.

The adoption and publication of these "official methods" has brought order out of chaos. The results of the work of the Association are published by the Division of Chemistry, U. S. Dept. Agriculture.

There are no dues, as publication and postage are paid for by the Department of Agriculture, while samples are sent out by C. O. D. express.

Its membership is assumed to include all official chemists—State, Municipal and Federal.

At the recent Jamestown meeting of the Association, 90 members were present. The meetings are usually held in Washington, where the attendance is often double this number.

AMERICAN SECTIONS, SOCIETY OF CHEMICAL INDUSTRY.

The New York Section of this Society was founded May 2, 1894. Since then, New England and Canadian Sections have also been established. The present membership of the New York and New England Sections combined is about 1500. It is the chief organization of industrial chemists in the country, and its journal is the best known publication of its kind. Among the reasons for its establishment, as stated by one of its founders, are (1) that the meetings of the New York Section of the American Chemical Society were at the time devoid of interest to chemical manufacturers; (2) that the American Chemical Society itself did nothing to promote chemical industry; (3) that it discriminated against industrial articles submitted for publication; and (4) that manufacturers were admitted only as Associates.¹

¹ It need hardly be said that these statements were based on an almost complete misapprehension of the attitude of the American Chemical Society toward Industrial Chemistry.

NEW ENGLAND ASSOCIATION OF CHEMISTRY TEACHERS.

Of quite a different type is the New England Association of Chemistry Teachers. Founded February 19, 1898, "to promote efficiency in the teaching of chemistry," this Association now has a membership of nearly 200. Any person interested in the teaching of chemistry is eligible to membership. The number of Active members is limited to 75, but no limit is set for the number of Associate or Honorary members. Three meetings a year are held, most of them occurring in the vicinity of Boston. The *Annual Report* of these meetings makes a volume of about 110 pages. Active members pay \$2.00 a year, Associates \$1.00. There are no local sections. The character of the permanent committees gives a good idea of the scope of the work. They are as follows: College requirements, current events and publications, high school course of study, industrial chemistry, laboratory construction, new apparatus, instruction, and social committee.

NEW YORK SECTION, VEREIN DEUTSCHER CHEMIKER.

Established in December, 1900, this New York Section has at present 125 members. Its meetings are generally held at the Chemists' Club in New York City, at the close of those of the New York Section of the Society of Chemical Industry, and are purely social in character. The official publication of the Verein is the *Zeitschrift für angewandte Chemie*.

AMERICAN ELECTROCHEMICAL SOCIETY.

The original call for the organization of this society was dated Philadelphia, October 19, 1901, and was sent to about thirty people. It was signed by Messrs. Hering, Reed, Richards, Roeber, Sadtler and Wahl, and began thus: "The rapidly growing importance of the subject of electrochemistry, and the want of suitable occasions in this country for the discussion of papers and questions pertaining thereto by those especially interested, have suggested the advisability of founding a national Electrochemical Society, similar in its organization to the American Chemical Society and the American Institute of Electrical Engineers."

The preliminary meeting was held at the Engineers' Club, Philadelphia, and it was decided to organize, provided seventy-five members were assured. A second circular letter was therefore sent out to engineers, chemists and metallurgists, including all members of the American Chemical Society and of the American Institute of Electrical Engineers. This was dated New York, November 25, 1901, and contained the following: "The products of electrochemical industries in this country at the present time amount to about one hundred million dollars per year. The growing importance of these industries and the fact that scientists and engineers interested in electrochemistry are now distributed among at least half a dozen different societies, and therefore have no common

medium of communication, suggested the formation of an American Electrochemical Society, on the same general plan as the American Chemical Society and the American Institute of Electrical Engineers. The bringing together in this way of those engaged in the scientific study of electrochemistry and the practical engineers and pioneers of the industry, will be of inestimable value to both."

It is appropriate to add that one of the most prominent of the charter members states that one of the reasons for forming a separate society was that electrical engineers interested in chemistry were, at that time, admitted by the American Chemical Society only as associates.

The meeting for organization took place at the Manufacturers' Club, Philadelphia, April 3, 1902, fifty-two members being present. The total number of charter members was 336.

Two volumes of *Transactions* are published annually, and three local sections have been formed: New York, Philadelphia and Madison (Wis.). The total membership at present is about 700.

WESTERN ASSOCIATION OF TECHNICAL CHEMISTS AND METALLURGISTS.

In 1904 this Association appeared on the scene. It was established because, in the opinion of its organizers, there was then no society in the country that met the needs of the men engaged in the extraction of metals and rare earths from their ores. It is incorporated under the laws of Colorado, with headquarters at Denver.

Its first general annual meeting was held at Denver, Colo., the second at Salt Lake City, and the third is now being held at Deadwood, S. D. Local sections have been established at Denver, Salt Lake City and Butte, and others are in process of formation. The total membership at present is about 250. The objects of the Association are the general advancement of technical chemistry, the improving and promoting uniformity in methods of metallurgical analysis and assaying, and the encouragement of research in the metallurgy of precious and rare metals. Any one interested in these objects is eligible for membership. The official organ of the Association is the *Western Chemist and Metallurgist*.

SOCIETY OF BIOLOGICAL CHEMISTS.

The latest separate chemical society is that of the biological chemists.

In 1899 a number of New York physiological chemists established the Society of Physiological Chemists. This is a purely local organization, meeting about once a month during the winter for the presentation and discussion of recent important work in this field. It is somewhat of the nature of a seminar in physiological chemistry, abstracts and reviews being submitted rather than original contributions.

The growth of this Society of Physiological Chemists, the development of the Biochemical Section of the American Chemical Society (established

1905), the increasing number of chemical papers on the programmes of the American Physiological Society and the great success of the recently established *Journal of Biological Chemistry*, "were among the influences that stimulated thoughts of a national organization of biochemical workers."

At the meeting for organization, New York City, December 26, 1906, the twenty-nine biological chemists present were addressed by Professor Abel as follows: "We have become convinced that there is need in this country for an organization which shall further the interests and foster the growth of biological chemistry. Biological chemists at present are affiliated with widely different societies and come little in contact with the great body of men who are interested in biochemical work. Whether we as chemists have as our field of work the physiological chemistry of our medical schools, or deal with the chemical problems of botany, zoology, pathology, pharmacology, or medicine, we all have one common meeting ground, and that is, chemistry as applied to animal or vegetable structures, living or dead. As distinguished from the work of pure chemists, organic or inorganic, our efforts are directed towards throwing light on the life processes and functions of living structures, with the help of chemical and physico-chemical methods. . . . Organization develops coördination of effort, encourages research, it furnishes the mechanism for competent criticism and helpful discussion and. . . . makes it evident to faculties of science and medicine, and to scientific and medical societies, that a great and growing department of research demands its fitting place in the general scheme of higher education. . . . I believe that we can have a society on broader lines than is possible to a mere section. We wish to draw into our society biological chemists in all departments of biology, including those organic and physical chemists who take a lively interest in our subject."

Eighty-one chemists enrolled as charter members. Their contributions are published mainly in the *Journal of Biological Chemistry*, which I understand, is not an official organ, but the private property of Messrs. Abel and Herter.

In the limited time available, I have endeavored to give you some idea of the more prominent American chemical societies of the past as well as of the present, the reasons for their establishment, the fields covered, and data indicating their present size and influence.

Even this hasty and imperfect survey unavoidably forces upon us the conclusion that, in the judgment of many of the chemists in the country, the American Chemical Society has not adequately met the needs in all branches of the work, otherwise these separate societies would not have arisen. Such a condition of affairs must, of course, cease, or total disintegration will only be a question of time.

I am happy to say that the Society is fully alive to the situation and that a larger future seems opening up before us. The first step in this direction has been taken—the publication of *Chemical Abstracts*. It might justly be called a stride rather than a step, for, in my opinion, no single act on the part of our Society could have done more to unite the chemists of the country than the publication of these abstracts, covering as they do every branch of the subject.

Any national organization of chemists, if it would be successful, must take into account the following factors:

- I. Specialization.
- II. Publication.
- III. Geographical location.

I. *Specialization*.—The history of chemical organization shows the usual evolution from the general to the special. First came the societies for science in general, then those devoted to chemistry alone, and now those for special branches, which, in their turn, may undergo a still further division in the years to come.

Every chemist has some one branch of the subject in which he is particularly interested. But little progress would be recorded were it not so. It is as fitting as it is inevitable, that those following the same specialty should wish to meet together periodically to discuss matters of mutual interest. It is equally certain that as they grow in numbers they will seek organization, and demand a medium of publication which shall give suitable recognition of the importance of their special branch of chemistry. The society which fails to take cognizance of the growing strength of specialization and to lay its course accordingly, fails to grasp its opportunities and slowly but surely will be crowded to the wall. We should not labor under the delusion that if our society fails to recognize this tendency to specialize, specialization will therefore cease.

The vital point is that the American Chemical Society must show that it can adapt itself to this condition, and by suitable changes in its plan of organization do far more for the fostering and stimulating of special branches of chemistry than could be accomplished by separate and independent societies. That this can and will be demonstrated, I confidently believe, and I am sure that every well-considered move in this direction will meet with the hearty approval of all.

The practice of holding our semi-annual meetings in sections is a move along this line, and I believe that a further advance would be the organization of these sections on a somewhat different basis. As a first step, they might elect their own officers to serve for a year, let us say, who shall do what they can to make the semi-annual meetings as successful as possible, by providing attractive programmes and a large attendance, inducing other organizations with similar interests to meet with

them (as the Society of Biological Chemists is now meeting with our Biological Section), pointing out to the Council in what ways the Society may be made more valuable to their particular group of members, and in general, doing whatever they can to stir up increased interest. These general sections should be given as large a measure of self-government as possible. Their presiding officers should be *ex-officio* members of the Council, and should be associated with the president and secretary in the preparation of the programmes for the general meetings. This is essentially the policy recommended in 1903 by the committee of which Dr. A. A. Noyes was chairman, and it is not unlikely that such a policy, particularly when accompanied by a suitable development of our publications, would lead some of the existing specialized societies to unite with us.

To those of our members who fear that such a move may introduce a disintegrating element, I would cite the recent action of the Verein Deutscher Chemiker.

This great German society, at its recent general meeting in Danzig, May 23-25, 1907, changed its constitution and by-laws so as to provide for the establishment of separate sections or groups (Fachgruppe) for those working in the same field.

So far, sections have been organized for Paper Chemistry, Fermentation, and Technological Chemical Instruction, and the following additional ones are contemplated in the immediate future: Heavy Inorganic Chemicals, Legal Protection of the Trade, Color Chemistry, Medico-pharmaceutical Chemistry, Analytical, Organic, Photo- and Electrochemistry, and Chemical Apparatus and Machinery. Calls have already been issued for the organization of several of these.

At the preliminary meeting for the organization of the Fermentation Section, in Berlin, the 11th of last November, Geheimrath Delbrück, in the course of his opening remarks, said: "that in the profession there is great need for the founding of such a section, is shown by the large attendance at this meeting and the numerous applications for membership." He stated further that 66 chemists had already signified their desire to join and that "there would thus be added to the Verein a whole group of new members." Some of those present even thought it wise to prepare for the formation of sub-sections within the sections.

To any one reading in the *Zeitschrift für angewandte Chemie* the reports of their meetings, it will appear that a wave of enthusiasm is sweeping all along the line as the direct result of this plan of establishing sections. Not only have the members no doubts whatever as to the beneficial effects of such a sub-division of the Verein, but they appear confident that it means a brighter future and a wider sphere of usefulness for their organization.

II. *Publication.*—The publications of the Society must truly represent the varied interests of the membership. To those of our number who are situated at a considerable distance from any large city and have no library accessible and no local section, the character of our publications is of preëminent importance. The development of specialization already alluded to must be provided for either (1) by the establishment of separate journals by our Society to more fully cover these special fields, or (2) by the development of appropriate divisions within our present *Journal*.

Under the former plan, some such division as the following might be suggested, although probably no two men would divide up the field in exactly the same way:

(1) Our present *Journal*, to contain articles of general interest, reviews, proceedings, and the like, as well as articles in those branches for which no special journal is provided.

(2) *Chemical Abstracts*. A publication needed by every chemist, no matter what his specialty, and a most valuable bond, therefore, in holding all chemists together.

(3) *A Journal of Industrial and Engineering Chemistry*, to include the best features of the existing journals of industrial and engineering chemistry and metallurgy.

(4) *A Journal of Biochemistry*. If consolidation with the Society of Biological Chemists could be brought about, the present *Journal of Biological Chemistry* might become the official organ.

(5) *A Journal of Inorganic and Physical Chemistry*, to include the present *Journal of Physical Chemistry*, or to be a continuation thereof. There is very good reason for believing that this can be brought about when the time seems opportune.

(6) *A Journal of Organic Chemistry*. If a way could be found acceptable to Dr. Remsen, by which the present *American Chemical Journal* would take this place, the problem would be a much simpler one.

Of these various journals, all the members would receive the first two, while the others would be furnished at a price slightly in excess of the actual cost—a price, by the way, far below that for which separate societies could afford to supply them. Or perhaps, some different arrangement would be deemed preferable.

The other plan contemplates segregation rather than separation, and has in mind the development of our present *Journal* until it somewhat resembles a union under one cover of all the various journals mentioned above, with the possible exception of *Chemical Abstracts*.

This latter plan has in its favor evident advantages. It would cost far less for publication, and such an enlarged *Journal* could probably be sent to all the members without any additional charge whatever. Uncertainties as to the proper place for an article to appear would arise only

as between subdivisions of one and the same journal, and not as between different journals. Repetition could be avoided by proper cross-references. There would never be any very great danger of a lack of sufficient material for such a journal. Its large circulation would also make it a most desirable medium for advertising, and the increased income from this source would still further reduce the cost of publication.

Perhaps the chief objection to such a plan lies in the rapidly increasing amount of material submitted to our various chemical journals. The bulk of this material if not already too great to be handled properly by any one journal, would certainly become so in the course of the next few years.

It may be that a combination of these two plans would appear best, arranging for the issuing of those separate journals which seem most urgently needed at the present time, if there are any such, and meanwhile developing the journal by a segregation of its contents, perhaps with suitable divisional headings, so that when the moment is most opportune these sub-divisions may start an independent career as special journals.

Already an able and energetic committee is at work on the question of the advisability of our publishing a *Journal of Industrial and Engineering Chemistry*, and we hope to have a report from them at this meeting.¹

III. *Location.*—As far as practicable, opportunities should be provided for our members in all parts of the country to hold periodic meetings. To insure this we have our Local Sections and migratory General Meetings. So far as the latter are concerned, however, the country is so large and our membership so widely scattered, that only a small proportion find it possible to attend. It might be wise, therefore, to hold one general meeting during the Christmas holidays, and during the summer have several separate gatherings in different parts of the country—say, one West of the Rockies and two or more in the East.

To return to my original statement, what the American Chemical Society needs is the enthusiastic and intelligent coöperation of its members. I am sure that the enthusiasm will be forthcoming, and I trust that the data presented may be of some service in helping you to decide intelligently as to the best plans for the development of our Society.

THE BROMATES OF THE RARE EARTHS.

Part I. A New Method for the Separation of the Yttrium Earths.

By C. JAMES.

Received December 6, 1907.

During recent years chemists investigating the rare earths have di-

¹ The report will be found in Proceedings of this number.