

## OPPOSITION TO THE FORMATION OF THE AMERICAN CHEMICAL SOCIETY <sup>(1)</sup>

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*James J. Bohning, Lehigh University*

On March 27, 1876, Professor Charles F. Chandler of the School of Mines at Columbia College and seven of his colleagues issued a short but specific invitation to members of the chemical profession (2):

Dear Sir: A meeting for organizing the American Chemical Society will be held on Thursday evening, April 6, 1876 at 8 o'clock P.M. in the lecture room of the College of Pharmacy, University Building, corner Waverly Place and University Place. Your attendance is earnestly required.

In spite of such short notice, 34 men assembled with Chandler at the appointed time on the New York University campus and promptly elected him president of the meeting (3). The subsequent motion by Isidor Walz "that we proceed to organize a national Chemical Society, which shall be called the American Chemical Society," provoked a vigorous discussion which finally resulted in an affirmation that was marred by three dissenters who submitted negative votes (4).

This lack of unanimity in the formation of the American Chemical Society (ACS) did not come as a complete surprise to the meeting's organizers. In fact, it was a continuation of action initiated almost two years earlier during the Centennial of Chemistry celebration held at a public school in Northumberland, Pennsylvania. At that magnificent meeting, generally considered to be the first national meeting of chemists held in the United States, the participants gathered with high spirits in a picturesque setting to honor the discoverer of oxygen, Joseph Priestley, whose last home and burial place were in Northumberland. In keeping with the name chosen for the meeting, they also examined the

development of chemistry in the United States over the centennial years 1774 to 1874 (5). The occasion of this meeting was prompted by a suggestion from Professor Henry Carrington Bolton of Columbia College, who proposed the centennial significance of the year 1874 (6), and by Professor Rachel L. Bodley of the Women's Medical College of Philadelphia, who later suggested the location (7). When Bolton urged the Chemical Section of the New York Lyceum of Natural History to undertake the organization of the affair, it was only natural that President J. S. Newberry appoint him chairman of the General Committee (8).

When the Centennial of Chemistry meeting opened promptly at 9 A.M. on Friday, July 31, 1874, Bolton acted as the temporary chairman. Although the assembly subsequently elected Charles F. Chandler as president and presiding officer for the two-day meeting, Bolton's efforts did not go unrecognized. A special resolution, passed just prior to adjournment on August 1, commended Bolton for his "considerable attention to details" that resulted in "a memorial gathering" to which all could "look back with the greatest satisfaction (9)." While much of that satisfaction derived from the physical location and the Priestley legacy, at least an equal amount must have been derived from the professional contact of 77 chemists previously scattered over 16 states and two foreign countries, and representing at least 25 academic institutions as well as many industrial firms.

For Professor Persifor Frazer of the University of Pennsylvania, there appeared to be a very logical course

## Opponents



Bolton



F. W. Clarke



Egleston



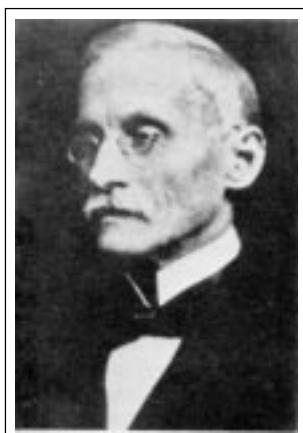
Fraser



Eben N. Horsford



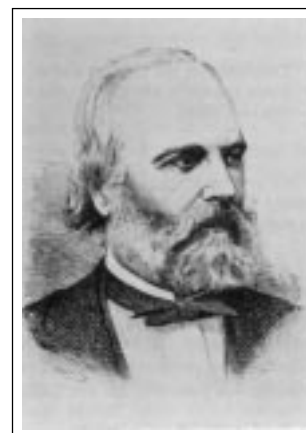
T. Sterry Hunt



Samuel W. Johnson



Benjamin Silliman, Jr.



J. L. Smith

of action to assure the scheduling of similar events in the future. Towards the end of the Friday afternoon session, Frazer proposed (5):

..the formation of a chemical society which should date its origin from this centennial celebration, and urged the importance of the fact that, while American chemists have done perhaps a larger amount of work in their own department proportionately than has been done in the world within the last century in any other branch of science, they have as yet in this country not a single society to represent the chemical thought of the country.

Frazer then moved (5):

..that a committee of five be appointed by the president, to whom shall be referred the advisability of calling a representative committee of chemists of the United States to form a chemical society, and all questions relating to the organization of the society.

While this urge to form an organization of chemists was, in part, a direct consequence of the camaraderie prevalent throughout the meeting, it was not new to the Centennial of Chemistry celebration. In a resolution adopted on May 11, 1874, the New York Lyceum of Natural History recognized that a "social reunion of American Chemists, for mutual exchange of ideas and observations, would promote good fellowship in the brotherhood of chemists (8). The organizing committee continued in its circular to stress that "a reunion of American Chemists ... would ... foster a feeling of fraternity among us." This sentiment was also echoed by correspondents responding to Bolton's first suggestion of the meeting in the *American Chemist* (6).

The New York *Daily Graphic* was even moved to capture this spirit in an unusual chemical metaphor, projecting that (10):

If the chemists who were at Northumberland ... had combined in certain definite proportions to accomplish what was really the obvious purpose of their merely mechanical mixture, ... the world would have cause to rejoice in their synthesis [for] hitherto America has done but little for the science, each chemist being but an isolated molecule giving but little show of affinity for others.

Frazer's motion, therefore, was a rational and natural reaction made with optimism and in anticipation of constructing an organization that would be directly related to the origins of modern chemistry through the Centennial of Chemistry celebration.

The first to respond to this proposal was the eminent mineralogist J. Lawrence Smith of Louisville, Ken-

tucky. Frazer must have been dismayed when Smith immediately stated that there were many difficulties in forming such an organization. "One formidable objection was that this country was too large, and that it would be impossible to centralize its chemical research." Continuing, Smith pointed out that "the very strength of the country is in decentralization. We want all of our scientific institutions dispersed far and wide."

Even Smith must have realized the weakness of this argument, for he then proceeded to present a more direct and specific premise:

We already have two great institutions in the country – the American Scientific Association and the American Academy of Sciences [11] – which undertake to embrace in their proceedings everything connected with chemical research, and it would be more creditable to the chemical talent of this country if an attempt were made to secure its better representation in the chemical section of the former association.

To support this line of reasoning, Smith included examples of foreign organizations:

Even the meetings of the Chemical Society of London, where there exists a great centralization of chemists, are very meagerly attended, the members preferring to read their papers before the more distinguished Royal Society. The same is true of the French Chemical Society, while the attention of the Academy of Sciences of France is constantly asked for papers of the highest importance relating to chemistry.

Smith's biased opinion was only partially correct, for in 1874 chemical societies were not only established in England, France, Germany, and Russia; they were also publishing journals devoted solely to chemistry (12). Yet, in the lengthy and "somewhat heated debate" that followed, only one speaker, Professor William H. Chandler of Lehigh University (and the younger brother of Chairman Charles F. Chandler) "presented forcibly many cogent arguments in favor of the formation of a national chemical society." He was outnumbered, however, by five other speakers who "advocated the earnest co-operation of the chemists as a body with the American Scientific Association, and that if a national chemical society were formed, it should be a permanent section of that body."

An evaluation of the effectiveness of these comments is best made by examining the stature of those who made them. William H. Chandler (age 32) was known to his audience as the co-editor of the first American chemical journal, *The American Chemist*, which he

had started with his brother Charles in 1870 (13). However, those speaking against the motion were also individuals whose reputations had attained national significance.

J. Lawrence Smith (age 55), who held the M.D. degree from the Medical College of South Carolina, was the first person from the United States to study under Justus von Liebig at Giessen. A former professor of medical chemistry and toxicology at the University of Louisville, he had published extensively on mineral analysis and had developed a process for the separation of alkali metals from silicates that bore his name. A cofounder in 1846 of the *Southern Journal of Medicine and Pharmacy*, Smith had recently published his treatise on "Minerals and Chemistry: Original Researches" in 1873. His services to foreign governments brought him decorations from France, Turkey, and Russia (14).

Benjamin Silliman, Jr. (age 57) had published textbooks in both physics and chemistry that were immensely popular in colleges throughout the country and was currently serving as editor of the *American Journal of Science and Arts*, a publication that had been founded by his father in 1818 (15).

Frank Wigglesworth Clarke (age 27) had just assumed his position as professor of chemistry and physics at the University of Cincinnati after previous positions at Cornell, Boston Dental College, and Howard University. In spite of his youth he had published many articles in the popular press. A series in Silliman's and Chandler's journals became "The Constants of Nature. Part I," which had just been published by the Smithsonian Institution in 1873 (16).

Eben Norton Horsford (age 56), having obtained a B.S. from Rensselaer Polytechnical Institute in 1836, was the second person from the United States to study with Liebig. He developed the first laboratory in America for analytical chemistry in the Lawrence Scientific School at Harvard, serving as Rumford Professor from 1847 to 1863 and Dean from 1861 to 1862. In 1863 he resigned his academic position to pursue industrial chemistry, founding the Rumford Chemical Company in Rhode Island from the profits of his invention of the phosphate baking powder as a yeast substitute (17).

Edward Travers Cox (age 53) grew up in New Harmony, Indiana, where he received his early training in chemistry and geology from David Dale Owen, assist-

ing Owen in the U.S. government field studies of the Upper Mississippi Valley and the geological surveys of Kentucky and Arkansas before the Civil War. He made an extensive survey of mining opportunities in New Mexico in 1864 and identified important coal deposits in southern Illinois. Appointed State geologist in 1869 by the Governor of Indiana, he immediately began his series of annual reports on the geology of Indiana. As State Geologist, Cox automatically filled the chair of geology at Indiana University (18).

Peter Henri Van der Weyde (age 61) was a physician with an M.D. from New York University, who held a faculty position with the Women's Medical College in New York. Previously, he had held faculty positions at New York Medical College, Cooper Union, and Girard College. Founder and editor-in-chief of *The Manufacturer & Builder*, which started in 1869 as a "practical journal of industrial progress," Van der Weyde obtained patents in 1867 and 1869 relating to a petroleum distillate product (called "Chemogene") and a compression ice system, which was used to construct artificial refrigeration systems throughout the south and in Philadelphia (19).

Sensing that Frazer's original motion would be crushed under the weight of such heavy opposition, Bolton offered a compromise in the form of an amendment:

That a committee of five be appointed from this meeting to cooperate with the American Association for the Advancement of Science [AAAS] at their next meeting, to the end of establishing a chemical section on a firmer basis.

The assembly gladly and quickly adopted the modified resolution, and Chairman Charles F. Chandler appointed Bolton, Silliman, Smith, Horsford, and Professor T. Sterry Hunt of the Massachusetts Institute of Technology as committee members. This strong allegiance to the AAAS effectively blocked the formation of the American Chemical Society at a time when it could have directly related its origin to the centennial of modern chemistry as it was celebrated in Northumberland.

In order to understand the rationale behind this virtually unanimous rejection of the Frazer proposal, it is necessary to examine the relationship of the objectors to the AAAS. For example, every member of the committee appointed by Chandler and all of the antagonists who spoke against the Frazer proposal were members of the AAAS; three of them were charter members dating back to the formation of the AAAS as a reorganiza-

tion of the American Association of Geologists and Naturalists in 1848 (20). Most were active members as well, holding a variety of offices at the annual meeting that was generally held in the fall of the year. Thus, Silliman had served as assistant secretary (1841-1843), secretary (1847-1848), and chairman (1841-1842), while Horsford had been general secretary (1849-1850). Most significantly, J. Lawrence Smith had served as president of the AAAS at the 21<sup>st</sup> Annual Meeting held in Dubuque, Iowa in August, 1872, with his term of office ending at the 22<sup>nd</sup> Annual Meeting held at Portland, Maine in August of 1873 (21).

At the Dubuque meeting only two chemical papers can be identified from the five presented before Section A on "Physics and Chemistry." The following year, however, in Portland, six chemical papers were presented in Section A, including one by F. W. Clarke. It was at the conclusion of this meeting that Clarke and others met informally to present "laboratory notes and informal papers." They found the mutual exchange of ideas so satisfactory that they adopted resolutions for the formation of a separate chemical subsection, which were to be presented to the Steering Committee at the 23<sup>rd</sup> annual meeting scheduled for Hartford, Connecticut on August 12-19, 1874 (22).

It is possible to identify two groups with different motives among those who united to support the AAAS. Through the end of the Civil War, American scientists were primarily generalists, with interests and publications spanning a wide range of topics and applications. Thus, in 1874, individuals such as Smith, Horsford, Silliman, Van der Weyde, and Cox (with an average age of 56) became part of the old guard who were reluctantly thrust into the beginning age of specialization, which was developing as a result of the industrial revolution. For those who were accustomed to following their own curiosity in "natural philosophy," the formation of a chemical society would be contrary to their belief that specialists would stifle the exchange of scientific thought by imposing boundaries for scientific investigation (23).

This attitude was expressed by the secretary of the Hartford AAAS meeting, who wrote (24):

The action taken by the ... formation of a Permanent Subsection of Chemistry was ... in accordance with the objects of the Association in bringing together scientists in all departments, that this expression on the part of ... special branches can only be regarded as most favorable towards the annual centralization

of scientific thought in the country during Association week, and it cannot be long before the American Association will draw within its folds ... many special organizations now existing, which ... working for one common end would thus still more greatly aid in the Advancement of Science in America.

This concern did not dissipate readily, for many years later, in describing the fiftieth anniversary of the AAAS, Daniel S. Martin complained that (25):

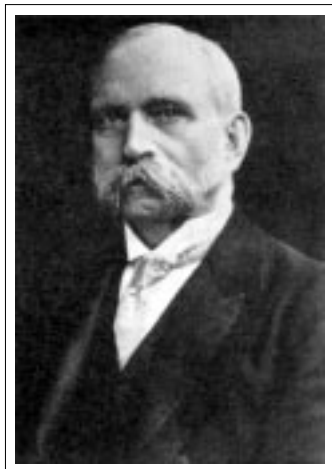
The increase of specialism has led not only to a division of the association into nine sections, in place of the two to three of its early years, but to the formation of several separate organizations of specialist which have been looked upon as tending to weaken, or even disintegrate, the main body. The American Chemical Society, the American Mathematical Society, and the Geological Society of America may be cited as leading examples.

For the younger chemists whose careers were just beginning, the concerns were much different. As the first group of specialists, their efforts had become more sophisticated and consequently more definite with regard to purpose. While their older colleagues often rambled through their scientific investigations with little cohesive planning, the new specialists were more careful to explore a topic in detail, not being averse to spending much of their lives on a single sub-specialty. This new attitude brought with it an increasing desire to exchange information with others who had similar special interests. It was within this framework that Clarke's group, whose average age was just 33, were preparing to finalize the new chemical subsection of the AAAS just two weeks after the Centennial of Chemistry meeting in Northumberland (26).

It is not surprising, therefore, that there was little enthusiasm for the possibility of forming a new society of chemists as proposed by Frazer. Further, since 20 of the 77 who came to Northumberland were already members of the AAAS (20), Bolton's amendment, seemingly the logical choice, was accepted without further comment. Subsequently, during the week of August 12, 1874, a Permanent Subsection of Chemistry of Section A of the AAAS was established, with Professor S. W. Johnson of Yale as Chairman and F. W. Clarke as Secretary.

Following almost immediately after the Centennial of Chemistry celebration, the Hartford meeting of the AAAS was the beginning of a long period of intense activity for chemists and the new subsection. The Bolton amendment was quite effective, for eight people who were in Northumberland a few weeks earlier became

### Proponents



Charles F. Chandler



William H. Nichols

members of the AAAS at Hartford (27). The number of papers of chemical interest increased to 25, including six by J. Lawrence Smith, two by F. W. Clarke, and three by P. H. Van der Weyde (28).

In 1875 Clarke sent a letter to the editor of *Popular Science Monthly*, describing the formation of the subsection of “chemistry, chemical physics, chemical technology, mineralogy, and metallurgy,” and urged interested readers to attend the 24<sup>th</sup> meeting of the AAAS in Detroit, Michigan, during the week of August 11. Concerned that the fledgling subsection needed full attendance “in order to make it a success,” Clarke pointed out that (29):

Chemistry has been but little represented in the proceedings of the Association, and the time now seems to have arrived in which some good work can be done.

In Detroit, three more attendees from the Northumberland meeting became AAAS members. Clarke presented three papers and Smith gave five, while H. C. Bolton was elected to replace Clarke as the secretary of the chemistry subsection at the next annual meeting (30).

According to its constitution, the chief object of the AAAS was “by periodical and migratory meetings to promote intercourse between those who are cultivat-

ing science in different parts of the United States.” These migratory meetings “gave American chemists for the first time an opportunity of obtaining periodic scientific contacts of a national character in different sections of the country (23).” As the new chemical subsection of the AAAS continued to attract new members and prepare for the 25<sup>th</sup> annual meeting in Buffalo, New York, in August of 1876, the concept of a separate national chemical society lay officially dormant.

Some of the New York chemists who were at Northumberland began privately to discuss the formation of their own chemical society. Their leader was Charles F. Chandler of Columbia University, who as head of a self-appointed committee of seven issued an invitation in January of 1876 to the chemists of New York to see whether there was sufficient interest to form a local chemical society. “Widely scattered as the chemists in this neighborhood are,” Chandler said, “such an association would become a centre [sic] of pleasant personal intercourse, and of an interchange of views, experience and researches which would benefit all concerned (31).” Chandler and his colleagues were not following up on the Frazer suggestion at the Priestley house, for their thinking was strictly focused on what would be beneficial to New Yorkers. Chandler’s circular was mailed to about 100 chemists in the New York City area. Less than half this number responded favorably, but Chandler and

his associates boldly forged ahead. This number, they said, "was so unexpectedly satisfactory" that it would be "deemed opportune" to attempt the formation of a national rather than a local organization. On March 22, 1876, the Chandler group sent another circular announcing their intentions, but this time the mailing list was a different group of 220 chemists throughout the country. To encourage this group, who would be considered "non-resident" members, that is, outside of a 30-mile radius of New York City, Chandler promised that at least one meeting a year would be held outside of New York, "at such a time and at such a place as to make attendance on the part of non-resident members more convenient and representative." Within six days, lured by Chandler's rhetoric, some 60 non-resident chemists returned a favorable response. Armed with what he considered to be a significant response to his polls, Chandler issued the call to meet on April 6, 1876, for the purpose of forming the American Chemical Society (32).

As chairman of this organizational meeting, Chandler began the proceedings by stating that:

the ultimate object was to bring chemists together in scientific and social intercourse, to secure rooms which would be open in the day and evening, and to establish there a library of reference and a chemical museum (33).

It fell upon Isidor Walz, acting as the secretary of the meeting and the organizing committee, to describe in some detail the steps that had brought the group together on that April evening. At the conclusion of his presentation, Walz referred to the existing opposition to the formation of a national society. Noting that the organizational committee did not share that opinion, he nevertheless reported that the opposition had been promised "the fullest opportunity to lay their views before the group," and he urged that the audience give them "earnest and careful attention." Walz then offered his motion to organize; and after a second to the motion, Chairman Chandler "declared the subject open to discussion."

The first to respond to the Walz motion was Professor Thomas Egleston, who started on a semi-positive note by stating that it "might be advisable to organize such an association," but not in 1876. His first objection was based on experience with the American Institute of Mining Engineers (AIME), which had been formed five years earlier. Noting that the \$6,000 income from the 600 members of the AIME was used entirely to publish its *Proceedings*, Egleston concluded that the 100 potential members of the new chemical society (those responding favorably to the Chandler polls of

January and March) would bring an income of \$500 to \$1000, which would not be sufficient to "publish *Proceedings* in a creditable and prompt way." His fear, that "it is hard to get money now—when it will be easier to obtain it, the success of such a society would be better assured" was not unusual but it was rather feeble. As with Professor Smith at Northumberland, Egleston then launched a more pointed argument that was immediately reinforced by the second speaker, Henry Carrington Bolton. Both men supported no immediate action by the group, claiming that it would be unfortunate to have a division of forces. Instead, they favored cooperation with two existing societies: the Chemical Section of the New York Academy of Sciences and the Chemical Section of the AAAS.

It is ironic that both of these opponents were colleagues of Chandler at Columbia. Bolton (age 39), a Columbia graduate who obtained the doctorate in 1866 with Friedrich Wöhler at Göttingen (just ten years after Chandler), was an assistant in analytical chemistry at the School of Mines and a faculty member at the Women's Medical College of New York. His extensive bibliographic compilation of the literature of uranium chemistry that appeared in 1870 was a direct result of his many research papers published on uranium compounds between 1866 and 1870 (34).

Professor Thomas Egleston (age 44) was the founder of the School of Mines at Columbia. When he presented his proposal to the Columbia Trustees in March of 1863, it marked the first attempt at a new form of education in mining and metallurgy in the United States and was strongly influenced by Egleston's experience at the École des Mines in Paris several years earlier. In fact, it was Egleston who personally recruited Charles F. Chandler to become the chemist on the new faculty of three when the school opened in November of 1864 (35).

The third person to comment negatively on the Walz motion was Professor Albert R. Leeds of Steven Institute of Technology. Leeds (age 42) acted as secretary of the Centennial of Chemistry celebration in Northumberland, and it is his vivid account in the *American Chemist* that still remains the most authoritative description of that meeting. Leeds was not emphatic in his comments, preferring simply to state that he "did not think the movement timely (36)."

The appeal of Egleston, Bolton, and Leeds on behalf of the existing organizations resembled that made in Northumberland in 1874. There were several differ-

ences, however, that were important to the outcome of the vote on the Walz motion. This time the speakers were local individuals who were not of the same national caliber as those in Northumberland. There was also much more of a direct concern that there would be a keen rivalry between similar organizations for the attention of a small number of potential members. Of particular interest was the effect on the New York Academy of Sciences. Although it had originally been founded as the Lyceum of Natural History in 1817, the new name had just been adopted in February of 1876 when an extensive revision to revitalize the organization was completed. As part of these changes, a section devoted entirely to chemistry had been established and was holding monthly meetings. The architect of these changes, which required "revising and remodeling the entire constitution and by-laws," was the vice-president, Thomas Egleston (37). His plea, however, did not have much effect on his listeners, for of the 35 present on April 6, only six were members of that organization, including Chandler, William Habirshaw (a member of Chandler's organizing committee), Bolton, Egleston, and Leeds (38).

In a similar manner Bolton, who was scheduled to replace Clarke as secretary of the chemistry subsection of the AAAS at the Buffalo meeting in August 1876, would certainly have been remiss had he not reminded the group about that existing organization and its chemical activities. Contrary to the response in Northumberland, his point had little effect this time, for there were only three AAAS members present: Bolton, Leeds, and Chandler.

After the lengthy remarks by Egleston and Bolton, Chandler appealed for help from his colleagues, suggesting "that it would almost seem as though we had met for the purpose of deciding not to organize a chemical society." In utter exasperation, Secretary Walz answered that "the apparent reluctance to discuss the subject was probably due to the fact that the chemists present had the subject before them so long and had discussed it so thoroughly in private that a prolonged expression of views at this meeting was deemed unnecessary." Nevertheless, he proceeded to present a brilliant rebuttal, aided by Herman Endemann (D. phil., Marburg, 1866, later to be the first editor of the *Journal of the American Chemical Society*), and Chandler's assistant at the New York Department of Health, and Meinhard Alsberg, also at the Health Department.

It was, however, the statement of William H.

Nichols, who at age 24 had just begun his career in the chemical industry, that was the most noteworthy as well as prophetic:

We did not come here expecting to find a society ready formed, with a library and a fine building; those would come in time. We have much intelligence assembled here, and that is better than a library. Much benefit would accrue to all branches of the profession from such a society as that proposed. *Let us begin this society small, let it do its work well, and it will undoubtedly grow.* [emphasis added]

On that note of optimism, Chandler called for the motion, which passed with three nays, presumably by Egleston, Bolton and Leeds. Moving quickly to the organizational business at hand, Chandler began to deal immediately with some of the opposition. The election of John W. Draper as the first president was precisely calculated to minimize the influence of those who might be tempted to continue attacking the new society (39). At the same time, the first nominating committee returned 21 other names for offices mandated by the newly adopted constitution, including H. Carrington Bolton (corresponding secretary), Albert R. Leeds (committee on papers and publications), and the absent J. Lawrence Smith (vice-president). Only Bolton refused to serve, preferring instead to continue his AAAS activities.

It would be many years before the conflicts between the AAAS chemistry subsection, the New York Academy of Science, and other chemical societies that materialized after 1876 would be resolved (40). When the ACS finally emerged as the national professional organization of chemists, many of those who had initially supported other societies became active and influential ACS members (Fig. 1). Unfortunately, the person who first publicly raised the concept of a national society in Northumberland did not remain committed to his own proposal. Persifor Frazer followed Bolton's suggestion and joined the AAAS in August, 1874. Later, he joined the ACS in July, 1876, but shortly thereafter resigned in January, 1877, during the initial stages of the prolonged controversy when detractors claimed the ACS was not a true national society but was in reality a local New York organization. Apparently, Frazer did not renew his ACS membership at a later date.

There remains one interesting and unanswered question. In the period from August 1, 1874 to January 22, 1876, there is no record of what those in New York who favored the original Frazer motion might be considering. Only three of Chandler's "self-appointed committee" were at the Northumberland meeting. Yet, ac-



*Figure 1.* ACS Activities of Those Who Initially Opposed ACS Formation

<u>Name</u>	<u>ACS Membership</u>	<u>ACS Office</u>
<b>A. Speakers at the Centennial of Chemistry, August 1, 1874</b>		
1. J. Lawrence Smith	April 1876	President, 1877
2. Benjamin Silliman	April 1876	Vice-President, 1878
3. Frank W. Clarke	1877*	President, 1901
4. Eben N. Horsford	1877	None
5. Edward T. Cox	?	None
<b>B. Petitioners for the AAAS Chemistry Subsection, August 12, 1874</b>		
1. Samuel W. Johnson	July 1876	Vice-President, 1877 President, 1878
2. T. Sterry Hunt	April 1876	Vice-President, 1877, 1886, 1887, 1889 President, 1879
3. George F. Barker	April 1876	President, 1891
4. Harvey W. Wiley	November 1876	President, 1893, 1894
5. Charles E. Monroe	April 1876	Vice-President, 1889, 1890, 1891, 1895 President, 1898
6. William McMurtie	April 1876	Vice-President, 1897, 1898 President, 1900
<b>C. Speakers at the ACS Organizational Meeting, April 6, 1876</b>		
1. Thomas Egleston	April 1876	None
2. Henry Carrington Bolton	?	Vice-President, 900
3. Albert R. Leeds	January 1878	Vice-President, 1879 – 1888

\* Clarke resigned after only two months of membership and did not rejoin the ACS until 1891. See J. J. Bohning, "Fighting City Hall: The Role of Washington Chemists in the Nationalization of the American Chemical Society," 220<sup>th</sup> National Meeting, American Chemical Society, Washington, DC, August 21, 2000; HIST 006.

ording to Isidor Walz, the subject was “before them so long” and “had been discussed thoroughly in private.” Evidently, none of the participants found it sufficiently important to make any notes of their informal gatherings (41). Yet, they continued in the face of very unfavorable conditions. On a local level, there was the New York Academy of Sciences, which was holding monthly meetings for chemists in New York City. On the national level, there was the AAAS chemistry subsection, which was growing and becoming increasingly active. During this period, however, Chandler and his committee continued to pursue the formation of a new organization when existing societies might have served their purpose. They set their sights on a local organization at first but quickly jumped to the national concept on the basis of a poll in which less than half of the people contacted were in favor of the idea of forming just a local group. Except for the bold determination and imaginative thinking of eight chemists from the New York City area, the American Chemical Society might not have come into existence for some time after 1876, if at all (42).

## ACKNOWLEDGMENTS

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## REFERENCES AND NOTES

1. Presented in part at the 184<sup>th</sup> National Meeting of the American Chemical Society, Kansas City, MO, September 13, 1982; HIST 008.
2. Original copies of this invitation are rare.
3. The March 27 invitation should not have come as a complete surprise, however, since the self-appointed organizing committee headed by Chandler had previously distributed inquires for interest in an organization of chemists on a local (January 22, 1876) and national (March 22, 1876) scale. See Ref. 4.
4. Identical detailed records of the first meeting of the American Chemical Society and the events that led to it may be found in a) *Am. Chem.*, **1876**, 6, 401-406; b) *Proc. Am. Chem. Soc.*, 1876, 1 (Part I), 1-20. This and all subsequent quotations pertaining to the first meeting are taken from the account in the *American Chemist*.
5. The most complete record of this meeting and the events that led to it were made by Professor Albert R. Leeds of Stevens Institute of Technology, who served officially as Recording Secretary. His faithful account was published in *Am. Chem.*, **1874**, 5, 35-44. The editors of the *American Chemist* later collected from their pages all of the material related to the meeting that was published in different issues (see following references) and produced a separate volume: *Proceedings of the Centennial of Chemistry*, Collins, Philadelphia, PA, 1875.
6. The meeting in Northumberland is often mistakenly identified as a meeting that celebrated the centennial of the discovery of oxygen, or “The Priestley Centennial (See, for example, H. Skolnik and K. Reese, *A Century of Chemistry: The Role of Chemists and the American Chemical Society*, American Chemical Society, Washington, DC, 1976, 4). However, Bolton’s now famous letter (*Am. Chem.*, **1874**, 4, 362) was quite clear in considering Priestley’s achievement as just one of many events that marked the year 1774 “as the starting point of modern chemistry.” The letter concluded by proposing “that some public recognition of this fact should be made this coming summer. Would it not be an agreeable event if American chemists should meet on the first day of August, 1874 [Priestley discovered oxygen on August 1, 1774], at some pleasant watering place, to discuss chemical questions, especially the wonderfully rapid progress of chemical science in the past 100 years?” In agreement with Bolton’s assessment of the centennial significance, the editors of the *American Chemist* used the “Centennial of Chemistry” banner for Bolton’s letter, as well as the responses his letter produced (*Am. Chem.*, **1874**, 4, 441-443), (only one correspondent disputed the Centennial of Chemistry label, but still supported the meeting concept), the general circular from the organizing committee (*Am. Chem.*, **1876**, 5, 11-13), and the Leeds report of the meeting’s minutes (Note 5). While the Northumberland gathering did pay homage to Priestley (*Am. Chem.*, **1874**, 5, 43-51), the organizing committee remained committed to Bolton’s original suggestion and scheduled several speakers to review the centennial aspects of chemistry. Thus, T. Sterry Hunt discussed “A Century’s Progress in Theoretical Chemistry” (*Am. Chem.*, **1874**, 5, 56-61); J. Lawrence Smith presented “The Century’s Progress in Industrial Chemistry” (*Am. Chem.*, **1874**, 5, 61-70); and Benjamin Silliman prepared a monumental listing of the “American Contributions to Chemistry” (*Am. Chem.*, **1874**, 5, 70-114, 195-209, 327-328). These three speakers were given positions of prominence, front row center, in the group photograph that was taken in front of a local building. Therefore, it is appropriate and desirable to use the “Centennial of Chemistry” descriptor rather than the

- more restrictive "Priestley Centennial" in reference to this meeting.
- Am. Chem.*, **1874**, 4, 441. Bodley proposed that "the centennial gathering be around this [Priestley's] grave, and that the meetings, other than the open-air one on the cemetery hilltop, be in the quaint little church built by Priestley." (The gathering did visit Priestley's grave, but the meetings were held in the local school rather than the church.) Bodley also noted in her letter that in her valedictory address delivered to the 22<sup>nd</sup> graduating class of the Women's Medical College on March 14 she had also called attention to 1874 as the centennial year of chemistry.
  - Bolton made his proposal at the May 11 meeting of the Chemical Section of the Lyceum. Other members of the committee were Charles F. Chandler, Henry Wurtz, Albert R. Leeds, and Charles A. Seeley. It was this committee that was responsible for all the subsequent preparations for the Centennial of Chemistry celebration. See *Proc. Lyceum Nat. Hist. New York*, **1874**, 2<sup>nd</sup>. Ser., No. 4, 144-145.
  - This and all subsequent quotations pertaining to the Centennial of Chemistry celebration are taken from Leed's account (Ref. 5).
  - New York Daily Graphic*, August 6 1874, p 252. See also M. G. Waring, "The Priestley Centennial, Turning Point in the Career of W. George Waring," *J. Chem. Educ.*, **1948**, 25, 647-652.
  - Smith was referring to the American Association for the Advancement of Science (formed in 1840 as the Association of American Geologists and Naturalists) and the American Academy of Arts and Sciences (formed in 1780).
  - The Chemical Society (London) was the oldest of the four organizations, beginning in 1841 with 77 members (coincidentally the same number present on the official list at the Centennial of Chemistry celebration). By 1874 it had almost 800 members and had been publishing a journal since 1847, first as a quarterly, and then, in 1861, as the monthly *Journal of the Chemical Society*. The Society received considerable support from Justus von Liebig; and by 1874 notable members who had held official positions included Hofmann, Faraday, Crookes, and Perkin, while Dumas and Cannizzaro had presented the memorial Faraday lectures. (See T. S. Moore and J. C. Philip, *The Chemical Society: 1841-1941*, London, 1947.) On the continent, the Chemical Society of Paris began in 1855 and started publishing the *Bulletin de la Société Chimique de Paris* in 1858. Shortly after Hofmann returned to Germany he founded the Deutsche Chemische Gesellschaft in 1866, and publication of *Berichte* began in 1868. The Russian Physical-Chemical Society was organized in 1869, and its journal commenced in the same year. (See A. J. Ihde, *The Development of Modern Chemistry*, Harper and Row, New York, 1964, 274-275 and references therein.) In spite of his comments, Smith was not adverse to using chemical journals for his own papers, having published 17 articles in the *American Chemist* between 1870 and 1874.
  - For more information on the Chandlers, See R. D. Billinger, "The Chandler Influence in American Chemistry," *J. Chem. Educ.*, **1939**, 16, 253-257.
  - For more information on Smith, see a) C. A. Elliott, *Biographical Dictionary of American Science*, Greenwood Press, Westport, CT, 1979, 238; b) D. H. Wilcox, Jr., in Wyndham D. Miles, Ed., *American Chemists and Chemical Engineers*, American Chemical Society, Washington, DC, 1976, 447-448; c) H. S. van Klooster, "Liebig and His American Pupils," *J. Chem. Educ.*, **1956**, 33, 493-497.
  - For more information on Silliman, see Ref. 14c and a) C. C. Gillispie, *Dictionary of Scientific Biography*, Charles Scribner's, New York, 1970-1979, Vol. 13, 434-437; b) Ref. 14a, p 237; c) Ref. 14b, pp 438-440.
  - For more information on Clarke, see a) Ref. 14b, p 82-83; b) Ref. 15a, pp 292-294; c) C. E. Monroe, *J. Am. Chem. Soc.*, **1935**, 57, 20-30.
  - For more information on Horsford, see a) Ref. 14b, p 230-231; b) Ref. 15a, Vol. 6, pp 517-518.
  - For more information on Edward Travers Cox, see a) James Grant Wilson and John Fiske, Ed., *Appleton's Cyclopaedia of American Biography*, D. Appleton & Co., New York, 1887, Vol. 1, 757; b) *The National Cyclopaedia of American Biography*, James T. White & Co., New York, 1904, Vol. 12, 328.
  - For more information on Van der Weyde, see W. R. Woolrich, *The Men Who Created Cold*, Exposition Press, New York, 1967, 118-119.
  - Smith, Silliman, and Horsford were charter members of the AAAS. The "official" list of the attendees at the Centennial of Chemistry celebration ("As far as I have been able to procure their names," according to Leeds) is given in Ref. 5. Detailed membership lists of the AAAS, including the dates at which the member was elected, were published as part of the annual *Proceedings*. See, for example, *Proc. Am. Assoc. Adv. Sci.*, **1874**, 23, xxvii ff.
  - For a complete list of officers of the AAAS from 1841 to 1882, see *Proc. Am. Assoc. Adv. Sci.*, **1882**, 31, xix ff.
  - Proc. Am. Assoc. Adv. Sci.*, 1874, 22, 424. Clarke's brief recollection of these events can be found in C. A. Browne, *A Half-Century of Chemistry in America*, American Chemical Society, Philadelphia, PA, 1926, Chapter 3. More details are given by M. Benjamin in *Twenty-Fifth Anniversary of the American Chemical Society*, Chemical Publishing Co., Easton, PA, 1902, 86-98.
  - For the early history of the AAAS and its relationship to American science, see S. G. Kohlstedt, *The Formation of the American Scientific Community: The AAAS 1848-1860*, University of Illinois Press, Urbana, IL, 1975; and S. G. Kohlstedt, *The Establishment of Science in America: 150 Years of the American Association for the Advancement of Science*, Rutgers University Press, New

- Brunswick, NJ, 1999. For the development of specialization in the nineteenth century, see R. S. Bates, *Scientific Societies in the United States*, MIT Press, Cambridge, MA, 1965, 3<sup>rd</sup> ed., Ch. 3.
24. *Proc. Am. Assoc. Adv. Sci.*, **1874**, 23, 153-154.
  25. D. S. Martin, *Popular Sci. Monthly*, **1897**, 51, 829.
  26. Clarke's colleagues included G. F. Barker, T. S. Hunt, S. W. Johnson, W. McMurtie, C. E. Monroe, and H. W. Wiley. Only Hunt was present at the Centennial of Chemistry celebration. Earlier, Hunt had responded to Bolton's idea of a centennial meeting by suggesting that it be held concurrently with the AAAS meeting in Hartford starting August 12 (See Ref. 5).
  27. Centennial of Chemistry attendees who joined the AAAS at Hartford were E. B. Coxe, E. T. Capen, A. H. Elliott, A. R. Leeds, T. R. Punchon, C. W. Roepper, E. H. Swallow, and E. Waller (See Ref. 20).
  28. See Ref. 20 for a complete listing and publication of some of these papers.
  29. F. W. Clarke, *Popular Sci. Monthly*, **1875**, 7, 365.
  30. See *Proc. Am. Assoc. Adv. Sci.*, **1874**, 23, xlvii, 99, 121. The three new members from the Northumberland meeting were S. H. Douglass, S. A. Goldschmitt, and Persifor Frazer.
  31. *Twenty-Fifth Anniversary of the American Chemical Society*, Chemical Publishing Co., Easton, PA, 1902, 39. At the time that Chandler issued this call, the migratory AAAS meetings, where all the national chemical activity was then taking place, had never been held in New York City since the AAAS had started 26 years earlier. The first meeting of the AAAS in New York City took place in 1887.
  32. See Ref. 4; the two ACS histories in Ref. 22; and C. A. Browne and M. E. Weeks, *A History of the American Chemical Society: Seventy-Five Eventful Years*, American Chemical Society, Washington, DC, 1952, for additional information on the preliminaries to ACS formation.
  33. Chandler's design for the new society was patterned after the European societies. See Ref. 12.
  34. For more information on Bolton, see Ref. 14 b, pp 40-41.
  35. For more information on Egleston, see D. Malone, *Dictionary of American Biography*, Charles Scribner's Sons, New York, 1930, Vol. 6, 50.
  36. In spite of these comments, Leeds became a faithful and active ACS member. For more information on Leeds, see *Proc. Am. Chem. Soc.*, **1902**, 24, 53-57.
  37. See the biographical notice by G. G. Kunze in *Trans. Am. Inst. Min. Eng.*, **1902**, 31, 14.
  38. For the membership list of the Academy, see H. L. Fairchild, *A History of the New York Academy of Sciences*, H. L. Fairchild, New York, 1887, 132ff.
  39. J. J. Bohning, "Prestige vs. Practicality in Selecting the First President of ACS," *Chem. & Eng. News*, **1982**, 60, March 8, 1982, 31-34.
  40. See the ACS history of Ref. 32 for more details.
  41. When C. A. Browne began preparing the 50<sup>th</sup> anniversary history of the ACS (Ref. 22), he asked Charles Chandler for details of the August 1874–April 1876 period (uncataloged letters in the Charles F. Chandler Papers, Butler Library, Columbia University). Chandler's only response was to submit a copy of the chapter he wrote for the 25<sup>th</sup> anniversary volume (Ref. 22).
  42. Drawing on the history of the first 20 years of the ACS, Sturchio has described the organization as a "gentleman's club" that "was the centerpiece of a network of metropolitan clubs and societies" which "served the social interests of the contingent of members with an interest in urban improvement and close ties to local commerce." See J. L. Sturchio, "Charles Chandler, the American Chemical Society, and Club Life in Gilded New York," presented at the Annual Meeting of the History of Science Society, New York City, December 27-30, 1979.

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