At the time Hahn was 55 years old and already Director of the Kaiser Wilhelm Institute for Chemistry (now the Max Planck Institute). A well established scientist, he had traveled abroad on numerous scientific missions, had discovered protactinium with his associate, Lise Meitner, (1878-1968) in 1918, and had written a textbook on radiochemistry. However, he apparently could not accept the new idea that the uranium atom was split into two fragments. It was Meitner who finally explained the results of the work as fission in 1939, a few months after she was forced to leave Germany. Hahn received the Nobel Prize in 1944. In his autobiography (8), published in 1966, his opinion of Noddack's contribution remained unchanged and he dismissed her with a single sentence: "Her suggestion was so out of line with the then-accepted ideas about the atomic nucleus that it was never seriously discussed".

References and Notes

1. E. Fermi, "Possible Production of Elements of Atomic Number Higher Than 92", *Nature*, **1934**, 133, 898-899.

2. Born Ida Tacke, married Walter Noddack (1893-1962) director of the Physikalische Technische Reichsanstalt in Berlin in 1926.

3. I. Noddack, "Über das Element 93" *Angew. Chem.*, **1934**, *47 (37)*, 653-656.

4. "Es wäre denkbar, dass bei der Beschiessung schwerer Kerne mit Neutronen diese Kerne in mehrere grössere Bruchstücke zerfallen, die zwar Isotope bekannter Elemente, aber nicht Nachbarn der Bestrahlten Elemente sind".

5. O. Hahn and F. Strassmann, "Nachweis der Entstehung activer Bariumisotope aus Uran und Thorium durch Neutronenbestrahlung; Nachweis weiterer aktiver Brüchstucke bei der Uranspaltung", die bei der Bestrahlung von Uran mit Neutronen Entstehen", *Naturwissenschaften*, **1939**, *27 (67)*, 11.

6. I. Noddack, "Bemerkung zu den Untersuchungen von O. Hahn, L. Meitner und F. Strassman über die Produkte, die bei der Bestrahlung von Uran mit Neutronen entstehen", *Naturwissenschaften*, **1939**, *27*, 212-213.

7. Translation by the author.

8. O. Hahn, *A Scientific Autobiography*, Scribner's, New York, 1966, p.140.

Dr. Fathi Habashi is Professor of Extractive Metallurgy at Laval University, Quebec City, Canada, GIK 7P4 and has written numerous articles on the history of industrial chemistry.

THE 1893 WORLD'S CONGRESS OF CHEMISTS

A Center of Crystallization in a Molecular Mélange

James J. Bohning, Wilkes College

For more than a decade after its founding, the American Chemical Society struggled to induce new members to join the 230 "charter subscribers" it had signed by the end of 1876. The membership roster slowly rose to the 300 mark, where it hovered for only a few years before plummeting to its nadir in 1889, when only 204 souls appeared on the official list. Yet, within seven years, the Society membership would break the 1000 mark and continued to increase for almost a century with only a few negative aberrations. This sudden and dramatic reversal in the numbers of those willing to invest time and money in a troubled organization signals the existence of events that plucked the Society from the precipice of extinction and secured its future as a leading professional organization for chemists.

The complexities of those crucial years centered around 1889 have not yet been completely unraveled by historians. However, there is no question that attention should be focused on the heated accusations that the original American Chemical Society was American in name only, and was really a New York based operation that had little to offer those outside of the city. The dissatisfaction culminated in 1889 with the attempted takeover by Washington chemists Harvey W. Wiley and Frank W. Clarke, who sought to form the Continental Chemical Society out of Section C of the American Association for the Advancement of Science and absorb the New Yorkers (1).

Their efforts were thwarted by Charles F. Chandler, the guiding hand behind the formation and operations of the ACS. Realizing that his organization was doomed if changes were not made, Chandler took less than a year to revise the constitution and hold the first general meeting outside of New York City. On short notice 43 chemists made their way to Newport, Rhode Island on 6 and 7 August 1890 to attend the first National Meeting of the ACS. At that meeting Clark acquiesced, agreeing to abandon the Continental Chemical Society and support the "new" ACS. To prove their intent of providing accessibility to more chemists and thus justify their claim to nationalistic territory, the Society held additional meetings in Philadelphia, Washington, New York, Rochester, and Pittsburgh in the next two years.

On 27 April 1893, Professor Albert C. Hale, head of the physical sciences department at the Boys High School in Brooklyn, New York, and General Secretary of the ACS, submitted a report to the ACS Council that detailed the current conditions of the Society, but also included some history and "prospects for the future". Hale, who served the Society on a

Table 1. Early World's Fairs

1851: London	Great Exposition of the Works of Industry of all Nations
1867: Paris	Exposition Universelle
1873: Vienna	Weltausstellung 1873 Wien
1876: Philadelphia	Centennial Exposition
1878: Paris	Exposition Universelle
1889: Paris	Exposition Universelle
1893: Chicago	World's Columbian Exposition

part-time basis, was enthusiastic as he gave the six major points of the operating plan derived from the ideas of chemists "from all parts of the country". Citing the retention of the original name, the formation of a Council to manage important affairs, the establishment of local Sections, the scheduling of two regular national meetings each year, and the signing of a contract for the regular publication of the *Journal*, Hale closed with an eloquent and optimistic prediction for the future. "Never before in the history of this country," Hale said, "has there been such immediate prospect of a large and powerful union of American chemists as there is today. ... More and better work is done in America than those of other countries are placing to our credit, and we have now, as never before, the means of securing adequate recognition and influence among the chemists of the world" (2). It is obvious that the Society was intent on moving rapidly from a local orientation to a posture that sought both national and international attention and support.

An ideal vehicle for achieving that objective was to occur in Chicago when the World's Columbian Exposition, also known as the Chicago World's Fair, would open on 1 May 1893, just a few days after Hale signed his report. The tradition of a grand exhibition was begun in London in 1851 with the "Great Exposition of the Works of Industry of all Nations" that featured the famous Crystal Palace. Major events that followed included the Paris World's Fair of 1867, where foreign governments were invited for the first time to erect their own buildings as a sign of international cooperation, the 1876 Centennial Exposition in Philadelphia, and the 1878 Paris Fair for which the Eiffel Tower was constructed (Table 1).

Although usually scheduled to coincide with a date of "patriotic significance", these 19th century fairs were also showcases for industrial and mechanical developments. The telephone and the typewriter were prominently featured in Philadelphia, while Chicago contained "the largest electrical exhibit and the greatest employment of electrical energy in the 19th century." It was the French who "gave the nonmaterial a special emphasis in their world's fairs." In 1889 they instituted "a series of intellectual and religious congresses" which were intended to "share information, stimulate new thought and effort, and ... indicate progressive development" (3).

Chicago Judge Charles C. Bonney seized upon that idea and successfully petitioned the Exposition Corporation to establish the World's Congress Auxiliary of the World's Columbian Exposition of 1893, with the motto: "Not things, but men." Gaining recognition from the U.S. Congress, the Auxiliary sent invitations to many countries, declaring that the "leaders of human progress" would convene to "establish mutual acquaintances and fraternal relations, review progress already achieved in various subject areas, define the still outstanding questions of the era, and receive ... suggestions of the practical means by which further progress might be made and the prosperity and peace of the world advanced" (4).

Convinced that "the crowning glory of the World's Fair of 1893 should not be the exhibit of the material triumphs, industrial achievements, and mechanical victories of man," but something more noble as demanded "by the enlightened and progressive spirit of the present age," the Auxiliary had 20 departments and 225 divisions that met at various times in Chicago between 15 May and 28 October. The Congresses included woman's progress, medicine and surgery, moral and social reform, music, education, art, science and philosophy, labor, Sunday rest, agriculture, the public press, temperance, commerce and finance, literature, engineering, government, social and economic science, religion, and public health.

The preliminary organization for the World's Congress of Chemists was conducted jointly by an ACS committee led by William McMurtrie of New York and a World's Congress Auxiliary committee chaired by Professor J. H. Long of the University of Chicago. ACS President Harvey W. Wiley was selected as the Chairman of the joint committee. Fifty-one American chemists, including Edgar Fahs Smith, William A. Noyes, and Ira Remsen, were selected for the Advisory Committee. In a bold move to establish credibility with their foreign brethren, the Americans selected 190 chemists from abroad to serve on this same committee. The list reads like the index from a history of chemistry text, but also serves as a reminder of the exciting developments in 19th century chemistry. Arrhenius, Beilstein, Cannizzaro, Le Chatelier, Erlenmeyer, van't Hoff, Kekulé, Mendeleev, Nernst, Ostwald, Perkin, and Soxhlet were only a few of the notables in the stellar lineup

Harvey Wiley

the Committee assembled as encouragement for foreign attendance and cooperation.

A preliminary list of ten subject classifications was made by the committee, and chairmen were assigned to agricultural chemistry, analytical chemistry, didactic chemistry, historical chemistry, inorganic chemistry, organic chemistry, physical chemistry, physiological chemistry, sanitary chemistry, and technical chemistry. Stressing the international nature of the meeting which would also be considered the 7th National Meeting of the Society, Wiley appealed to all American chemists to assure that the distinguished visitors received "proper attention from their co-laborers on this side of the water." He also reminded them that this was not only a scientific, but also a "patriotic duty," and that "every chemist in the United States should feel that it is his privilege as well as duty to do something towards making the Congress a success" (5).

On 1 July, Wiley issued an updated circular indicating that 15 foreign chemists had already agreed to present papers ranging from "Standard Methods of Oil Analysis" to "The Influence of Patent Laws on the Development of Chemistry." He urged that all papers be submitted by 1 August because it would "be difficult to arrange for a position on the program after that date." However, Wiley noted that "in all cases the place of honor on the program" would be given to foreign visitors. There were other chemical attractions as well. The Chemical Section of the AAAS would be meeting in Madison the week before, and the Association of Official Agricultural Chemists, The American Pharmaceutical Association, and the American Institute of Mining Engineers were also holding meetings in Chicago at the same time. It was quite a line-up of events for any chemical visitor to the "windy city", and Wiley assured them that some warm days were to be expected, but "the situation of the city on the edge of a vast open prairie extending for nearly a thousand miles north and west without a break" meant refreshing breezes on even the hottest days. Considering that the lake breezes also helped from the other direction, Wiley felt that "no one need be deterred from attending the Congress on account of severe heat".

Wiley closed with another appeal to American chemists "to be present for the purpose of welcoming our foreign visitors and showing them the progress of chemical science in the United States" (6).

When the Columbian Exposition was dedicated on 21 October 1892 (it had been delayed a week because President Harrison was attending a large celebration in New York on 14 October), the parade of over 100,000 was a sign of the magnitude and grandeur of the project. More than 200,000 people attended opening ceremonies on 1 May 1893. During the next six months more than 27 million people passed through the gates, with some daily attendance approaching three-quarters of a million.

Any attempt to describe the fair quickly runs out of superlatives. Over 400,000 cubic yards of earth were moved twice just to prepare the site of 1000 acres at Jackson Park. More than one million plants, including 100,000 willow trees, were used in landscaping. The largest roofed structure in the world was among the 220 buildings constructed over a three-year period by more than 10,000 workmen. The Manufactures and Liberal Arts Building had sufficient floor space to mobilize the entire Russian army. Its walls could have contained the United States Capitol, the Great Pyramid at Giza, Winchester Cathedral, Madison Square Garden, and Saint Paul's Cathedral with room left over. It was said that the designers must have been "very near to God" and one artist suggested that it compared to the biblical "new Jerusalem" or "Heavenly City" (4).

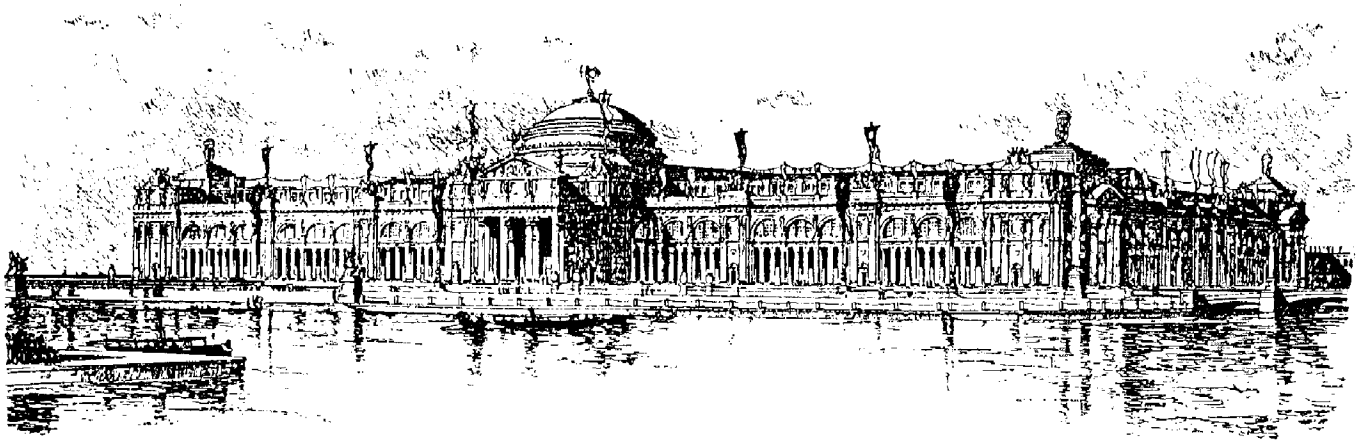
There were a number of exhibits that were of special interest to chemists. In the Agriculture Building chemical methods applied to agriculture, materials from chemistry for improved farm production, and the results from agricultural experimental stations were on display. In the Mines and Mining Building, the Standard Oil Company had an elaborate show of all phases of oil production and refining, the Germans had a complete cement-testing laboratory, and the English showed a 1000-ounce ingot of palladium and a 240-ounce ingot of iridium. Chemical manufactures were displayed by the United States, England, France, Germany, Russia, Sweden, and Italy. There were 38 American firms in this group, but it was admitted that they could not be favorably compared to the Europeans. Even the U.S. Census Bureau admitted that the statistics of American chemical manufacture were difficult to obtain. One correspondent expressed dismay at the British exhibits, which were not in keeping with the size of their chemical industry; the French items arrived late, and their catalog was in disarray. In contrast, the Germans presented a unified appearance that resulted from the typical Germanic attention to detail and organization. They accounted for more than half of all the chemical manufacturers at the Fair, and

included fundamental industries such as acids, paper, glass, and soap; pure chemical preparations used in photography, pharmacy, and laboratory reagents; coal tar products; inorganic and organic pigments for printers, painters, and glaziers; glue and gelatine animal products; and fats, oils, soaps and cosmetics. The Germans also displayed a valuable collection of books, photographs, and instruments, many of which were of historical significance. In the Electricity Building there were innumerable exhibits of electrical equipment and machinery, including a large number of physical and chemical apparatus manufactured in Germany. Finally, scientific education was presented by Harvard, MIT, University of Pennsylvania, Johns Hopkins, Princeton, and Yale (7).

The World's Chemical Congress opened on Monday, 21 August, with an address by President Wiley. As with most visitors to Jackson Park, Wiley was overwhelmed by the entire affair. "The whole world of art, the whole world of work, and the whole world of skill," he pronounced, "are brought to us in a reality which, were it not so tangible, would seem the deception of a wizard." But his next statement could be as appropriate to the current ACS Campaign for Chemistry as it was to the nation and the world almost a century ago. Wiley observed that chemistry, which was still a young and growing scientific discipline, had done more than any other to make the Chicago Exposition a reality. Noting that chemistry was not well-suited for display, he pointed out that "chemistry is pleased to show the way to human progress, quite content to be forgotten when it is achieved. It asks for no white palace with imposing portals in which to display the wonders of its wealth. In odd nooks and corners, scattered over the vast expanse of space, attached to every other exhibit in an unobtrusive way, its silent work is revealed in countless combinations..." There were no statues of Priestley or Lavoisier, but the "fruits of their labors" could be found in almost every exhibit (8).

For the next five days, 76 speakers presented papers in nine Divisions. Only the physiological chemistry division did not materialize, and the historical division became the bibliography division. One third of the speakers were from foreign countries, including Germany (eight), France (seven), Great Britain (four), Switzerland (two), Australia (one), Holland (one), Italy (one), and Russia (one). Each day was chaired by an honorary president, all but one from a foreign country, and was opened with a major address, followed by a number of shorter papers on diverse subjects (Table 2). The chairs included E. Engler, Karlsruhe, Germany; G. Thoms, Riga, Latvia; H. B. Proctor, Leeds, Great Britain; G. Lunge, Zurich, Switzerland; and A. B. Prescott, Ann Arbor, MI. It was the first time that ACS members participated in a divisional meeting structure. Not surprisingly, the technological, analytical, and agricultural chemistry divisions had the most participants (9)

Most of the papers were eventually published in the Society's *Journal* (10). They were virtually ignored by the rest of the scientific literature, except for brief scattered reports in *Science* and the *Journal of the Society of Chemical Industry*. True to Wiley's prediction about the unobtrusive nature of chemistry, the chemical congress was virtually ignored by the popular press, who found speakers declaring the Fair a "Divine Exposition" and a "great theological institute" more interesting material than those who were "determining the melting point of butter fat" or wondering if "pentoses were formed by the assimilation process."



The Agricultural Hall was typical of the grandiose architecture of the Fair

The exposition closed on a somber note on 30 October with a simple cannon salute and the lowering of the flag. Those attending the ceremonies left to the strains of Beethoven's Funeral March because two days earlier the mayor of Chicago had been assassinated. Similarly, the fairgrounds were being consigned to dust as the fate of Chicago's White City had not been determined. Ravaged by weather and vandals during the following winter, it was virtually destroyed in a great conflagration set by arsonists on 5 July 1894. The site was completely dismantled within a year, and only a few buildings remained. (The Chicago Museum of Science and Industry now occupies

Table 2. Papers Delivered in the Various Divisions

Division	Papers	Chair
Technological	18	McMurtrie, New York City
Agricultural	16	Atwater, Middletown, CT
Analytical	15	Prescott, Ann Arbor, MI
Organic	8	Witt, Berlin
Didactic	6	Stone, Lafayette, IN
Physical	6	Warder, Washington, D.C.
Inorganic	4	Clarke, Washington, D.C.
Bibliography	2	Bolton, New York City
Sanitary	1	Ellen Richards, Boston, MA

what was the Art Palace.)

The American Chemical Society fared much better. There were 182 people in attendance, but it is hard to assess the significance of this number. Only 83 were ACS members, about 20% of the total membership. Nevertheless, the Society did achieve one of its objectives. By the end of 1894 the membership was twice what it had been in 1892, and the yearly increase of 262 members for 1894 would not be bettered until 1907. Included among those who joined at the World's Fair were four future ACS Presidents and Charles L. Parsons, who later served for 35 years as Secretary of the Society.

But the major thrust of the meeting had been a long-term goal of establishing both national and international cooperation among chemists. In his opening remarks Wiley encouraged chemists to leave the isolation of desk and laboratory "to seek the acquaintance of his fellows. Every time you take a brother chemist by the hand," Wiley remarked, "you enlarge your life and extend your strength, and the farther apart the field of your activities, the greater the benefit." Speaking to the foreign visitors, Wiley cautioned them not to be surprised about what seemed to be a lack of *esprit de corps*. He explained that "we have been whirled hither and thither in the wild molecular mélange of a rapidly growing country" in which newly forming "centers of crystallization" would bring more unity of action. Wiley emphasized the ACS as one of these emerging centers, and offered "their united hand, big, brawny, and right honest in its grasp," to the foreign dignitaries (8).

Wiley had even larger plans, however. He concluded that "the lesson of the Congress" was not only the "special forms of activity manifested in the titles" of the papers but in "a larger, unprinted program ... illuminated with the light of higher and broader views, bearing a greeting of good fellowship and fraternity and the promise of a more intimate union of all science." Wiley closed the opening day of the Congress by appointing a committee of five to consider his suggestion that a Triennial International Congress on Chemistry should meet at various cities throughout the world.

The group, headed by Wiley's close friend Frank W. Clarke and including Charles E. Munroe and H. Carrington Bolton, wasted little time in acting. Citing similar triennial congresses in geology, medicine, and pharmacy, the committee sent letters to all the chemical societies of the world requesting the appointment of a similar Committee of Conference to join with the ACS in organizing a series of Chemical Congresses "in which the chemists of the various nations can regularly meet together for the discussion of common interests" (11). The American Chemical Society, led primarily by Wiley, would play a key role in the formation of international chemical congresses following in the tradition of the very first such meeting, the great Karlsruhe congress of 1860. As the ashes of the Columbian Expedition were being cleared in August of 1894 from Jackson Park in Chicago, the First International Congress of Applied Chemistry was being held in Brussels under the patronage of the Belgian government (12). But the American influence in the events that followed, leading to the formation of the International Union of Pure and Applied Chemistry in 1919, is another story.

References and Notes

1. J. Bohning, "The Continental Chemical Society", 187th National ACS Meeting, St. Louis MO, 1984.

2. C. A. Browne and M. E. Weeks, *A History of the American Chemical Society: Seventy-Five Eventful Years*, American Chemical Society, Washington, D.C., 1952, pp. 44-48.

3. J. Allwood, *The Great Expositions*, Studio Vista, London, 1977.

4. Complete descriptions of the Fair can be found in D. F. Burg, *Chicago's White City of 1893*, University of Kentucky, Lexington, KY, 1976; R. Badger, *The Great American Fair*, Nelson Hall, Chicago, IL, 1979; and J. W. Shepp and D. B. Shepp, *Shepp's World's Fair Photographed*, Bible Publishing Co., Chicago, IL, 1893.

5. H. Wiley, "Announcement of the Joint Committee on the World's Fair Chemical Congress", *J. Am. Chem. Soc.*, **1893**, *15*, 43. (January number but not published until 13 May.) Confusion about dates exists because of lengthy delays in publishing the *Journal's* monthly issues.

6. H. Wiley, "The World's Congress Chemical Auxiliary of the World's Columbian Exposition", *J. Am. Chem. Soc.*, **1893**, *15*, 106 (February number, issued 11 July) and H. Wiley, "Congress of Chemists at Chicago", *Science*, **1893**, *21*, 356 (30 June issue).

7. A lengthy description of the Fair's attraction to chemists is given in J. H. Long, "Chemical Notes from the Columbian Exposition. I.", *J. Am. Chem. Soc.*, **1893**, *15*, 250 (May number, issued 14 September); *ibid.*, **1893**, *15*, 312 (June number, issued 6 October). For a broader view see also, G. H. Johnson, "The World's Congress Auxiliary of the Columbian Exposition", *Science*, **1893**, *22*, 116; and Anon., "The Columbian and the Centennial Exposition", *ibid.*, **1894**, *23*, 63.

8. H. Wiley, "Address of Welcome to the World's Congress," *J. Am. Chem. Soc.*, **1893**, *15*, 301. (June number, issued 6 October.)

9. The complete program, including a list of attendees, is given in R. B. Warder, "Proceedings of the Congress on Chemistry Held in Chicago, Illinois, August 21 to 26, 1893", *J. Am. Chem. Soc.*, **1893**, *15*, 305 (June number, issued 6 October.)

10. These papers are scattered throughout *J. Am. Chem. Soc.* for 1893 and 1894 but are poorly identified as having originated at the Congress.

11. F. W. Clarke, et al., "International Chemical Congresses", *J. Am. Chem. Soc.*, **1894**, *16*, 880.

12. The only mention of the Brussels meeting by the Society occurred in the preliminary announcement for the 2nd International Congress of Applied Chemistry held in Paris in 1896; see Anon., *J. Am. Chem. Soc.*, **1896**, *17*, 307.

James J. Bohning is Professor of Chemistry at Wilkes College, Wilkes-Barre, PA 18766 and is particularly interested in the history of the ACS. He is a Past-Chair of the Division and is currently serving as its historian.

TRANSLATIONS

The following experiment is taken from Tiberius Cavallo's "A Treatise on the Nature and Properties of Air," London, 1781. Readers wishing to submit their interpretations of the chemistry involved, complete with balanced equations, should send their answers to the editor by the copy due date listed inside the front cover. Answers will appear in the next issue along with a fresh puzzle.

Dr. Higgins' Experiment of Detonating Cupreous Nitre by Contact with Tin. This salt [i.e., cupreous nitre] taken moist, but not very wet, and beaten to the fineness of basket sea-salt in a mortar, is to be strewed to the thickness of a shilling on a piece of tin, twelve inches in length, and three in breadth.

Then the foil is to be instantly rolled up, so as to include the salt as it lay between the coils. The ends are to be shut by pinching them together, and the whole is to be pressed flat and close.

All this being done as quick as possible, the first part of the phenomena is, a part of the salt deliquesces. 2. The part, impregnated with tin changed in colour, and of a thicker consistence, begins to froth forth from the ends of the coil. 3. A strong frothing, accompanied with moderate warmth. 4. The emission of copious nitrous fumes. 5. Heat intolerable to the fingers. 6. Explosion and fire, which burst and fuse the tinfoil in several places, if it be very thin.

The Answer to Last Issue's Puzzle

No reader responses were received and, indeed, it took the editor nearly a week of library research to unravel the mystery. The result, which is quite interesting, appears as this issue's *Whatever Happened To ... ?* column.

WHATEVER HAPPENED TO HOMBERG'S PYROPHORUS?

William B. Jensen, University of Cincinnati

"Homberg's Pyrophorus" was accidentally discovered by Wilhelm Homberg (1652-1715) sometime around 1680 while attempting to extract an "odorless white oil" from human excrement for the purpose of transmuting mercury into silver (1). In the course of these experiments, Homberg distilled the excrement with a wide variety of other materials, one of which happened to be common potash or potassium alum [$K_2(SO_4)Al_2(SO_4)_3.24H_2O$], and noticed that, after cooling the apparatus and breaking open the luting, the dry residue in the retort spontaneously burst into flame.

This result quite naturally caught Homberg's attention, as one of his abiding fascinations, like that of many of his contemporaries, was with the preparation and study of materials which were either spontaneously inflammable or phosphorescent or both. Indeed, during his student travels in Italy, he had investigated the preparation and properties of the so-called Bologna Stone, a form of phosphorescent barium sulfide, and he later perfected a recipe for a phosphorescent variety of calcium dichloride (known as "Homberg's Phosphorus") made by heating a mixture of slaked lime [$Ca(OH)_2$] and sal ammoniac [$(NH_4)Cl$]. Homberg is also credited with having obtained the original recipe for the preparation of elemental phosphorus from Johann Kunckel, supposedly in exchange for a toy barometer invented by Otto Guericke in which the humidity of the air was indicated by "a little man who came out of his house and stood at the door in dry weather but retired under cover in moist weather"(2). Apparently in the 17th century trinkets could buy more than just prime New York real estate!

Incredibly, given his persistent interest in both pyrophoric and phosphorescent substances, Homberg failed to follow up on his alum-excrement observations until 1711, or nearly 30 years after the original experiments, when he again returned to the subject and finally published a paper describing the preparation and offering a rationale for its properties (3). Assuming the product to be a mixture of a water-free salt (obtained from the alum) and an easily inflammable oil (obtained from the excrement), he postulated that its spontaneous ignition was due to the reaction of the salt with the moisture in the air. Like the reaction of quick lime [CaO] and water, this reaction supposedly generated sufficient heat to ignite the inflammable oil.

Homberg initially described his mixture as yet another kind of "phosphorus", but later adopted the more appropriate term of "pyrophorus" - a word which eventually came to signify all spontaneously inflammable solids. The curious properties of