large. This matrass must then be placed in a crucible, or other earthen vessel, large enough to contain the body of the matrass, and about half an inch besides all round it, which space is to be filled with dry sand. This apparatus must then be put into the fire which must be raised gradually, till the whole becomes red hot, in which state it must be kept for about one hour or till a quarter of an hour after a weak sulphurous flame has begun to appear at the mouth of the matrass. The apparatus is then to be removed from the fire, and the moment that it loses its redness, the mouth of the matrass must be stopped with a cork, and when the whole is sufficiently, though not quite cold, the matrass must be taken out of the crucible, and the pyrophorus it contains, which is a blackish, mostly granulated powder, must be decanted into a dry phial, which must afterwards be kept exactly stopped, in order to preserve the pyrophorus for a long time. The principal properties of this substance are the following: As soon as a small quantity (sometimes a few grains of it are enough) of it is exposed to the open air, it quickly becomes red hot, and is capable of setting fire to paper, tinder, etc. If the air, and substance upon which the pyrophorus is dropped, are very dry, the accension is slowly, and sometimes not at all effected; but it may be promoted by breathing upon it; which shows that the pyrophorus requires moisture as well as the presence of air, in order to take fire. If the bottle is not closed very well, the pyrophorus will imbibe the moisture by small degrees, so as to lose its burning property in a short time. After combustion, the pyrophorus, or rather its ashes, will be found to be increased in weight. Although alum and sugar were directed above to be used for making the pyrophorus, yet it may be made with other matters, though perhaps not so well, nor with so much certainty; for the necessary and principal ingredients are the vitriolic acid and phlogiston; hence it may be made with any vitriolic salt besides alum, and almost any other substance capable of furnishing the inflammable principle, besides sugar.

The Answer to Last Issue's Puzzle

Aqua regia is a combination of the strong acids, nitric acid and hydrochloric acid. Traditionally this liquid was made using one part of nitric acid and three parts of hydrochloric acid. However, Cavello states his aqua regia is made with four parts of "nitrous" (nitric) acid and only one part of "marine" (hydrochloric) acid. This probably was to limit the production of chlorine gas for the following reaction:

$$4H_3O^+(aq) + 3Cl^-(aq) + NO_3^-(aq) \leftrightarrow NOCl + Cl_2(g) + 6H_2O$$

which occurs because the nitrosyl chloride present in the mixture catalyzes the reaction (1).

Regulus of antimony is the product of heating stibnite, Sb_2S_3, with lead in a furnace. The regulus metal is a 5-12% antimony compound containing some iron impurities (2). Grinding the regulus to a powder would expose some "free" antimony and facilitate the reaction.

The regulus powder reacts in the manner described by Cavello due to the reaction:

$$Sb(s) + 3/2\ Cl_2(g) \leftrightarrow SbCl_3(s);\quad \Delta H_f^\circ = -382.5 kJ\ mol^{-1}$$

The heat of formation shows the exothermicity of the reaction which would account for the light seen as the antimony and chlorine come into contact. This reaction occurs at a "micro-level" because of the minute quantities of antimony and chlorine which come into contact; therefore, only a flash of light is seen. Antimony does not react with HNO_3 (3) and its high reactivity with chlorine is presented in many textbook photographs, such as the one on page 56 of our text at Notre Dame, *General Chemistry*, 2nd ed., by McQuarrie and Rock.

Karen M. Morris, University of Notre Dame

References and Notes

1. M. C. Sneed and R. C. Brasted, *Comprehensive Inorganic Chemistry*, Vol. 5, D. Van Nostrand Co., Inc., New Jersey, 1956, p. 95.

2. W. Gardner and E. I. Cooke, Eds., *Chemical Synonyms and Trade Names*, 5th ed., Technical Press Ltd., London, 1948, p. 433.

3. W. H. Nebergall, H. F. Holtzclaw, Jr., and W. R. Robinson, *General Chemistry*, 6th ed., D. C. Heath and Co., Lexington, MA, 1980, pp. 935-937.

Hints for the Perplexed: Help in deciphering 18th-century chemical nomenclature and terminology for apparatus can be found by consulting Jon Eklund, "The Incomplete Chymist: Being an Essay on the Eighteenth-Century Chemist and His Laboratory, with a Dictionary of Obsolete Chemical Terms of the Period," Smithsonian Press, Washington, D.C., 1975 and W. Gardner and E. I. Cooke, "Chemical Synonyms and Trade Names," 6th Ed., CRC Press, Cleveland, 1968.

REPORT OF THE PROGRAM CHAIR

The obvious highlight of this meeting was the seven-session symposium on the History of Electrochemistry. Almost 40 papers on topics ranging from classical electrochemistry to such modern topics as electrodeless conductivity were presented over a four-day period. The speakers, in keeping with the international character of the meeting, came from many places on the globe including the United Kingdom and Czechoslovakia, as well as the expected speakers from the host countries of Canada, the United States and Mexico. In addition

to Classical Electrochemistry, other topics included Electrosynthesis, Electroanalytical Chemistry, Fundamental Electrochemistry, Industrial Electrochemistry, Electrode Systems and pH Measurement. This symposium, organized by John Stock of the University of Connecticut, will be published as an ACS Symposium Series Volume some time later this year. Division members will receive a substantial discount if they purchase the book using the coupon which will appear in this *Bulletin.*

Other features of the program were two half-day sessions of general papers dealing with interesting chemical personalities, industries specific to Canada, textbooks, chemical education and biochemistry. The regular presidential cachet paper was replaced, appropriately enough for this meeting, by a paper on the 1893 World's Congress of Chemists.

One very lovely feature among the HIST-related events was the opening of the Croft Chapter House, the first chemistry laboratory at the University of Toronto, and the display therein of chemical memorabilia held by the University. This event was orchestrated by Drs. W. A. E. McBryde and R. Freisen of the University of Waterloo with the cooperation of the University of Toronto Archivist, Dr. Richardson.

I would like to commend my two programming counterparts who so ably worked with me in preparation for this meeting, Dr. W. A. E. (Peter) McBryde and Dr. Silvia Tejada from UNAM, Mexico City.

Finally, a brief reminder that the Los Angeles meeting is almost here. The Hahn/Strassmann Golden Anniversary Symposium will take place on Monday, and the Dexter Award Session and Luncheon will be on Tuesday. Also on Tuesday will be the third in our series of Information Sources in the History of Chemistry, and specifically California and the West Coast. Please also note that the deadline for paper titles for the Dallas meeting is November 20.

Mary Virginia Orna, College of New Rochelle

AWARDS

The Dexter Award

The 1988 Dexter Award for outstanding accomplishment in the history of chemistry has been awarded to Dr. Lutz F. Haber of Bath, England. The award, which consists of a cash prize of $2,000 and an engraved plaque, will be presented to Dr. Haber at the Divisional Luncheon in Los Angeles.

Born in Berlin in 1921, the son of Charlotte Nathan and Fritz Haber, winner of the 1919 Nobel Prize in Chemistry, Dr. Haber received his early education in Germany and Switzerland. Moving to England in 1936, he received a B.Sc. in Economics from the London School of Economics and a Ph.D. from the University of London. His subsequent career has spanned the private industrial sector, government employment and academia. From 1946-1949 he worked for an oil refinery in Manchester; from 1949-1963 for I.C.I. Ltd., and from 1963-1967 for Esso. This was followed by a three-year stint with the National Economic Development Office and by his appointment in 1970 as Reader in Economics at the University of Surrey-Guildford, from which he retired in 1986.

Dr. Lutz F. Haber

Dr. Haber's contributions to the history of chemistry rest on his two book-length studies of the European chemical industry: *The Chemical Industry During the 19th Century* and *The Chemical Industry: 1900-1930* and his volume *The Poisonous Cloud: Chemical Warfare in the First World War*, all of which have been published by Oxford University Press.

Persons wishing to nominate or renominate candidates for the 1989 Dexter Award should send their recommendations to the Divisional Secretary by 1 January 1989. New submissions should include a letter of nomination and a complete vita for the candidate. Reprints of not more than three recent publications may also be included.

The Outstanding Paper Award

The Outstanding Paper Award for 1988 has been awarded to Dr. Jeffrey L. Sturchio of AT&T Bell Labs for his paper "Charles Frederick Chandler (1836-1925) and the American Chemical Society," presented at the 1987 Spring National Meeting in Denver, Colorado.

Dr. Sturchio holds a B.A. in History from Princeton University and a Ph.D. in the History and Sociology of Science from the University of Pennsylvania. After teaching at the New Jersey Institute of Technology, he was appointed in 1984 as the Associate Director of the Center for History of Chemistry, a position which he held until his transfer to Bell Laboratories early this year.

Besides his activities on the Executive Committee of HIST,