ARCS & SPARKS

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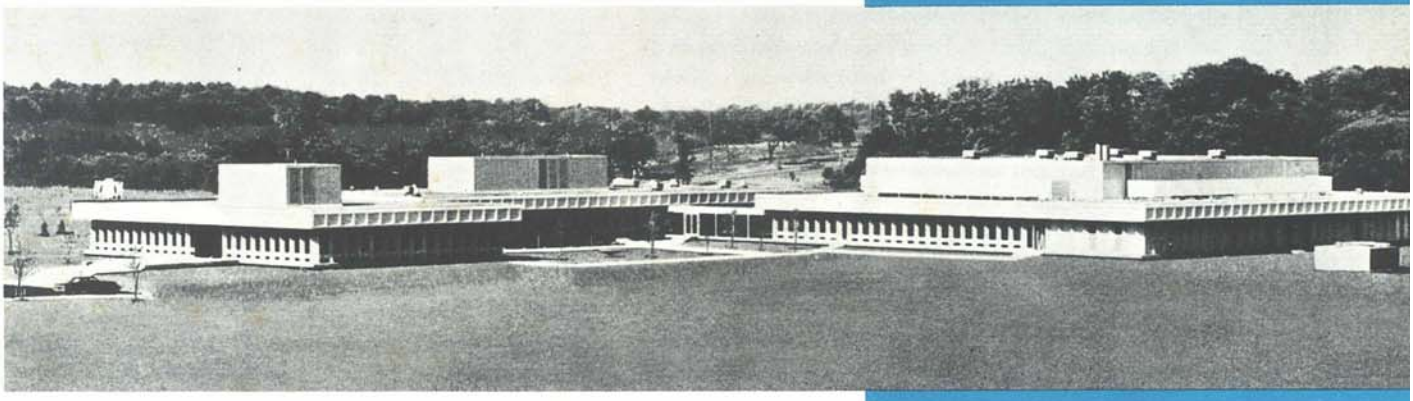

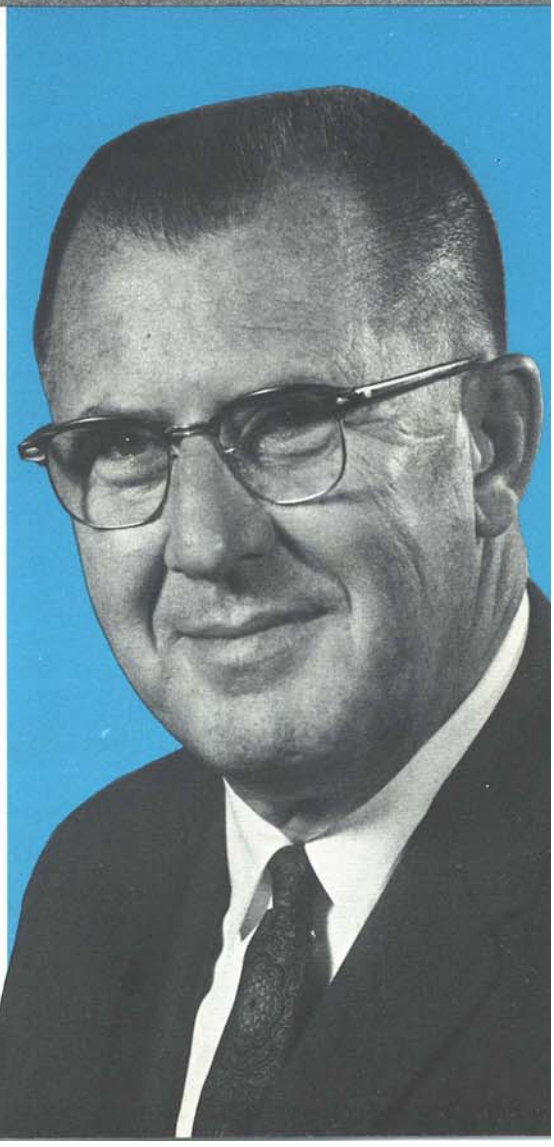

A Salute to Dr. Herman A. Szymanski— Past President SAS

Each year as we prepare this feature article we are awed by the responsibility that is placed on the individual who carries the title, President of SAS. Not only must he be a leader in his field, but he must lead and guide the society in its growth and toward its goals of advancement. The society singles him out as the man who is representative of all the society stands for. It recognizes him as a leader, one who can keep the society functioning in an efficient and progressive manner.

This honor and faith was well placed when SAS chose Dr. Szymanski its leader for 1967. He is Professor of Chemistry and Chairman of the Department of Chemistry at Canisius College, Buffalo, New York. The department reflects Dr. Szymanski's interest in instrumentation, having many gas chromatographs, an NMR spectrometer and infrared and Raman spectrophotometers. Immediately adjoining his office is a research lab containing U.V. and IR spectrophotometers and one of the most advanced gas chromatographs. The room has several filing cases filled with infrared reference curves. Under his direction three week-long institutes are conducted at Canisius College. These are on gas chromatography, NMR and infrared spectroscopy.

Dr. Szymanski is proud of his 15 year association with Canisius College. Under his direction, the Chemistry Department has emphasized both research and teaching. A recent Journal of Chemical Education article ranked Canisius ninth of nearly 1,000 non-Ph.D. schools in journal publications. Nineteen of its chemistry graduates in the past 15 years are now teaching at various colleges and universities throughout the country.

A native of Toledo, Ohio, Dr. Szymanski received a Chemical Engineering degree from the University of Toledo and his Ph.D. from Notre Dame University. He was completing his Masters Degree in Physics while teaching at Loyola University of Chicago when he transferred to his present position.

He has authored seven books and edited nine. He points out the one he is most proud of is the paperback edition of an infrared text. Selling for a very low price it has found its way into a large number of undergraduate curricula.

On the Niagara Frontier, Dr. Szymanski served in various capacities for the SAS, including chairman of the Section. As program chairman for two years, he held a course in emission spectroscopy the first year and on NMR Spectroscopy the second. He received the Niagara Frontier Award of Achievement in 1964.

In infrared spectroscopy Dr. Szymanski has been interested in arsenic chemistry. As he puts it, "I am happy to be about finished with these studies which have continued since my graduate school studies. I suspect I have been exposed to enough arsenic to last me the rest of my life."

Dr. Szymanski's varied activities and interests have not prevented him from enjoying his devoted family. He and Mrs. Szymanski take great pride in their seven children; and the "Father of the Year" award, bestowed on him in 1966 by one of the Buffalo newspapers, will probably remain in his memory as the most cherished honor he will ever receive.

You have served us well, Dr. Szymanski; our society has gone forward under your capable leadership. Our sincere thanks and best wishes for your continued success.

Arcs & Sparks is published by Ultra Carbon Corporation, P.O. Box 747, Bay City, Michigan 48706, for the advancement of the profession of spectroscopy. News stories, changes of address and other pertinent correspondence should be directed to the Editor.

LABORA-STORY OF THE MONTH

Climax Molybdenum Company of Michigan

A subsidiary of American Metal Climax, Inc.

Ann Arbor, Michigan

Many of the technological achievements that have led to the growing use of molybdenum are the results of contributions made by The Climax Molybdenum Company of Michigan. Through independent research, and collaboration with others throughout the world, the Climax Molybdenum research program has been able to identify and develop many of the technological merits of molybdenum.

The Climax Molybdenum Company began its research program in 1931 in Detroit. Today the company occupies a 30-acre site in Ann Arbor, Michigan, adjacent to the North Campus of the University of Michigan, one of the leading research areas in the world. The ultra modern, three-unit structure contains 55,000 square feet of space for research laboratory activities, administrative offices and conference facilities. In addition to being in a highly favorable research atmosphere, the company is close to the center of the steel-producing and steel-consuming industries of the nation.

Climax Molybdenum Company of Michigan is a subsidiary of AMAX (American Metal Climax, Inc.), a widely diversified natural resources and minerals development company. AMAX mines, smelts, refines, fabricates and markets metals and minerals. AMAX activities extend over a broad range of materials including molybdenum, tungsten, aluminum, copper, lead, zinc, cadmium, iron ore, metal powders, zirconium, hafnium, precious metals, uranium, vanadium, agricultural chemicals and petroleum.

The Climax laboratory has, from time to time, undertaken specific investigations for the other AMAX divisions when the specialized equipment and skills of the Ann Arbor laboratory could be utilized to best advantage.

The long-range objective of research at Climax Molybdenum includes a basic and applied research program in physical metallurgy, metallurgical and chemical processing and chemical research. Priorities in the program are determined by a balance between the indicated potential of commercial and technical opportunities in molybdenum.

The metallurgical research is concerned primarily with ferrous metallurgy, since by far, the major consumption of molybdenum is in this field. Fundamental studies are in progress to relate the effect of molybdenum additions to steel on microstructure and mechanical properties; i.e., hardenability, strengthening and elevated temperature behavior. Also, considerable effort is devoted to research in refactory metals.

The development of a process for producing malleable arc cast molybdenum and molybdenum base alloys was an important outgrowth of the refractory metals research at the Climax Molybdenum Research Laboratories.

Chemical research is divided into three broad categories: (a) exploratory research to elucidate the basic chemistry of molybdenum; (b) synthesis and development of new chemicals; and (c) applied research to define the areas of use for molybdenum in catalysis, inhibitive pigments and lubrication (MoS_2).

The Analytical Chemistry Group is organized to provide analytical service and to analyze products produced by the various research groups. Since standard analytical procedures are frequently nonexistent for these products — usually exotic alloys and new chemicals — considerable research is needed to develop suitable procedures.

A wide variety of sophisticated instrumentation is available to the Analytical Chemistry Group. These instruments include recording and nonrecording spectrophotometers for visible and ultraviolet light; an infrared spectrophotometer, a dual grating emission spectrograph, a gas chromatograph; an atomic absorption spectrophotometer; and thermal analysis equipment for differential thermal analysis and thermogravimetric analysis. The accompanying photographs illustrate some of these instruments as well as equipment used by the Alloy Development Groups.

Office and Research Laboratory of the Climax Molybdenum Company of Michigan, 1600 Huron Parkway, Ann Arbor. Administration Unit, Laboratory Unit, and Technical Operations Unit (left to right).

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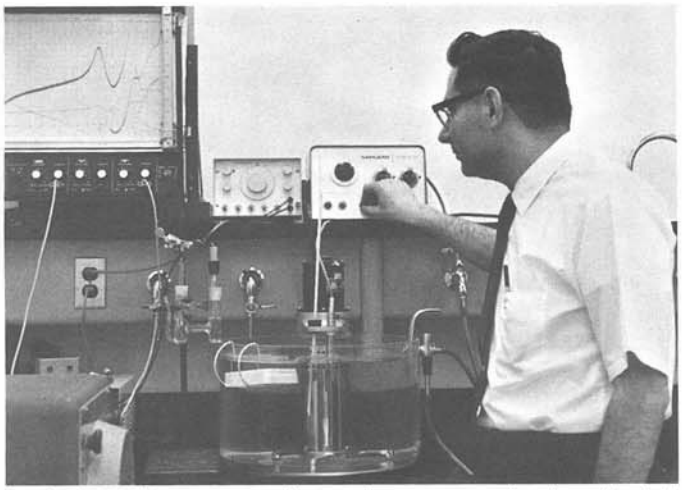
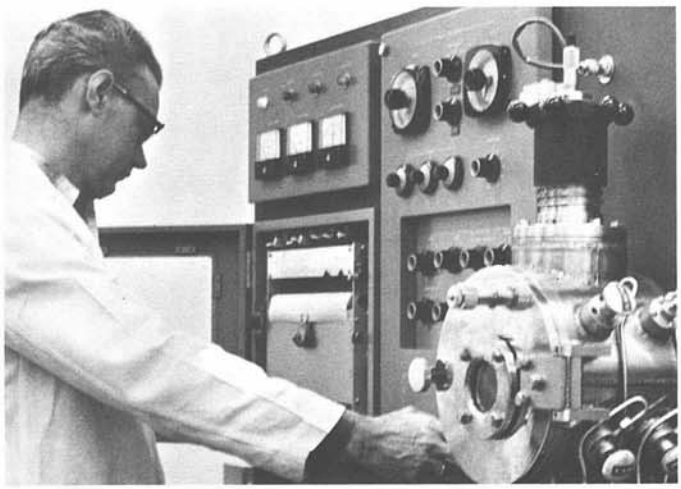
Wet chemistry facilities in the general analytical laboratory.

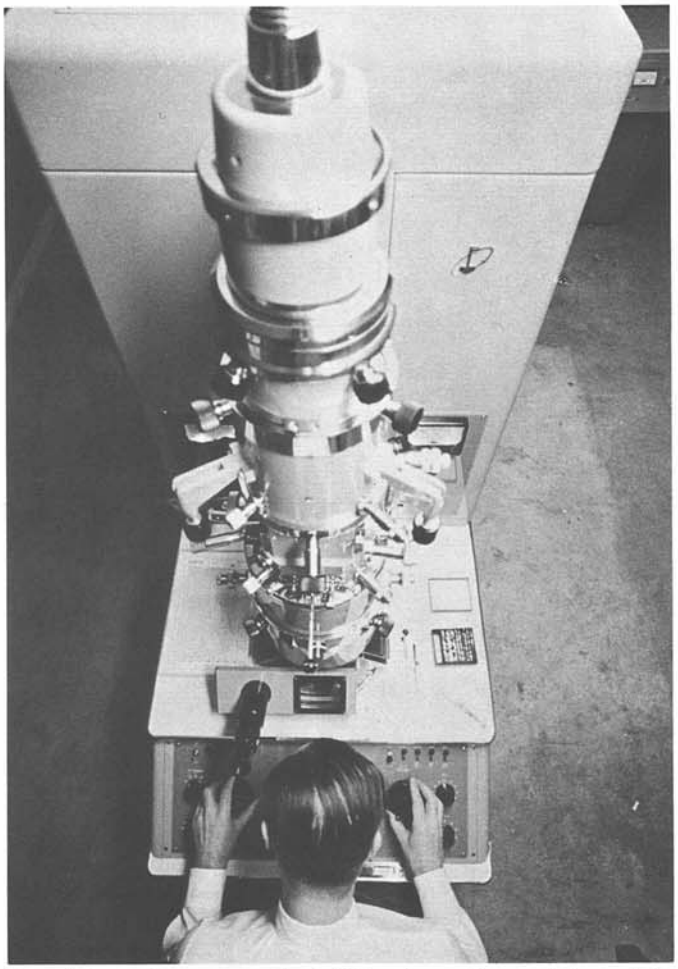


Dr. G. A. Tsigdinos uses a polarograph to measure the electrochemical properties of molybdenum compounds.

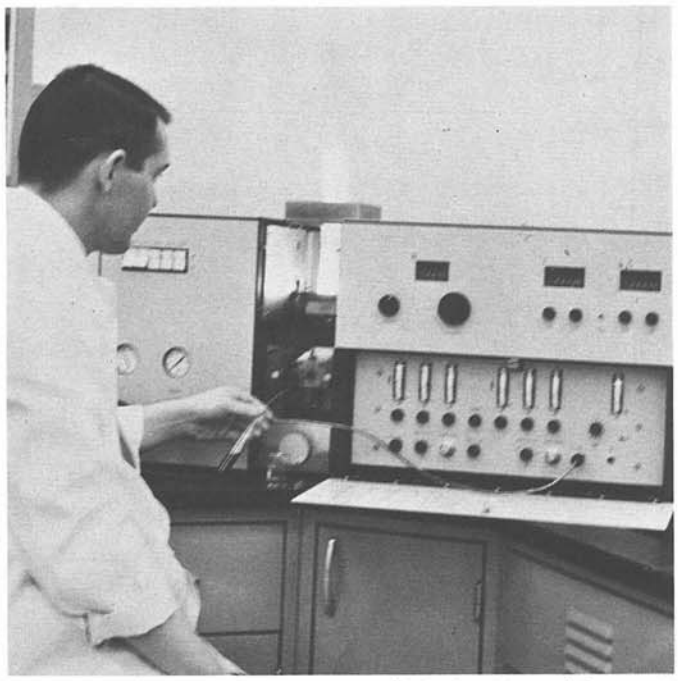
T. J. Risdon studies the effectiveness of molybdenum disulfide additive to cutting fluids. The instrument at the far left is a four-ball wear tester.



Technician W. Peterson measures transformation kinetics of steel samples on a high-speed dilatometer.



The electron microscope, with facilities for replica and transmission microscopy as well as electron diffraction, has proved to be an essential tool in studies of strengthening mechanisms, transformations, and fracture in steel and in molybdenum-base alloys.



R. C. Binns determines trace amounts of titanium in steel by atomic absorption spectroscopy.

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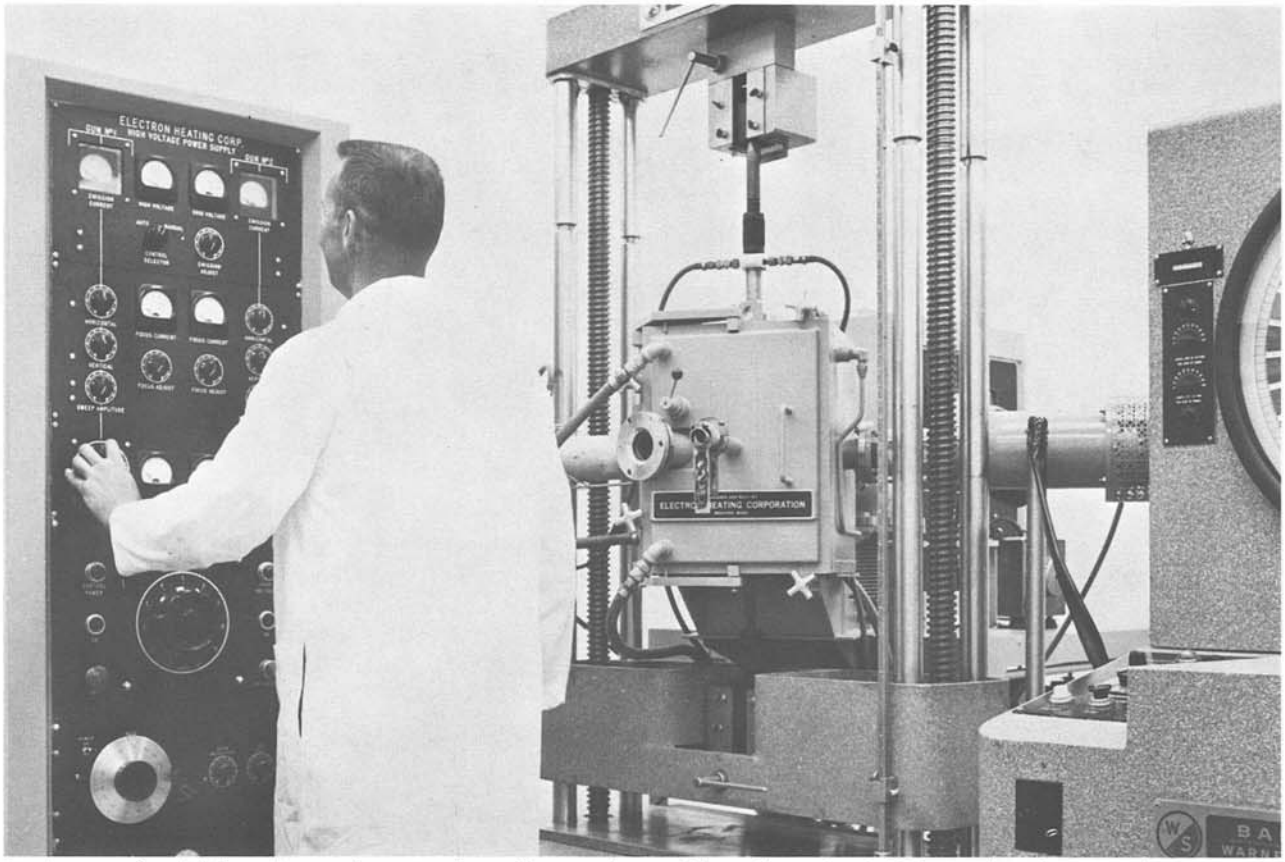
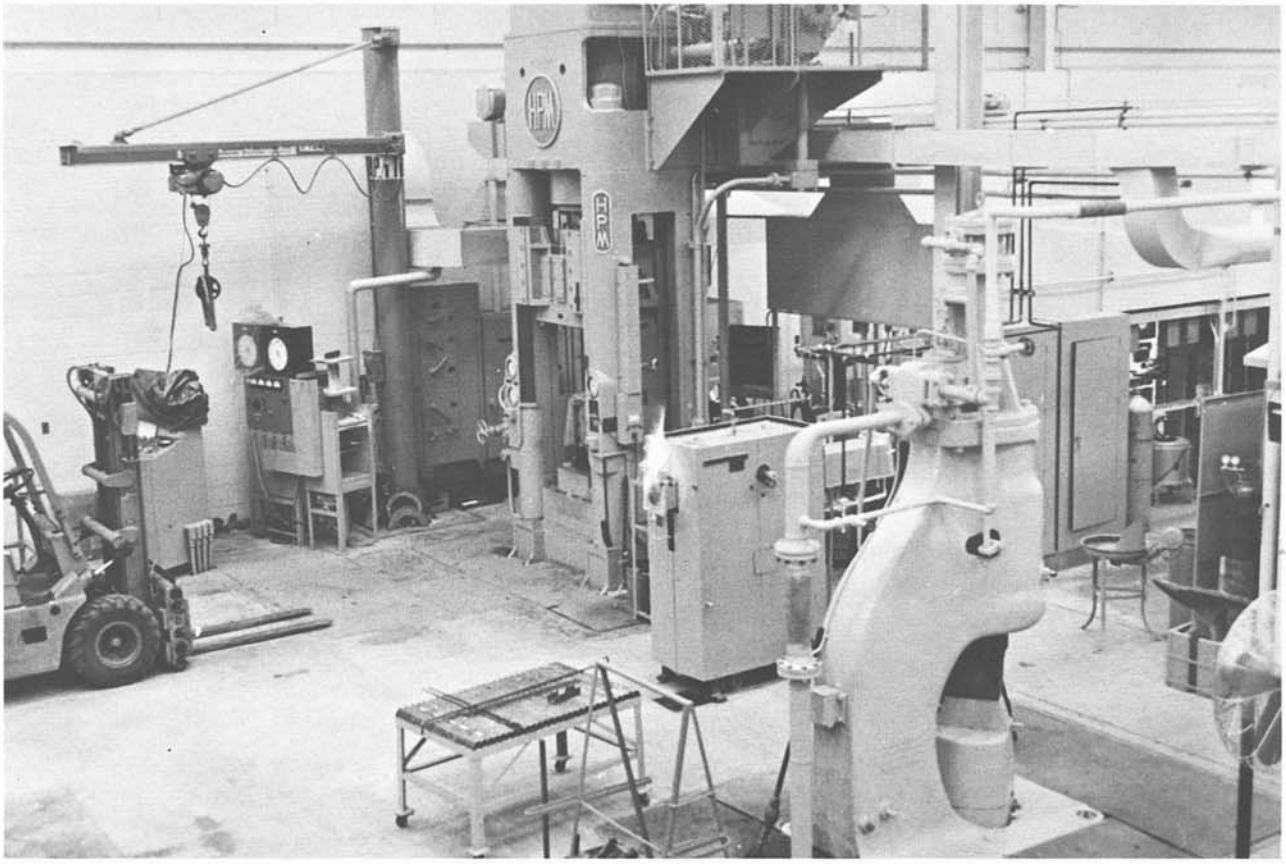


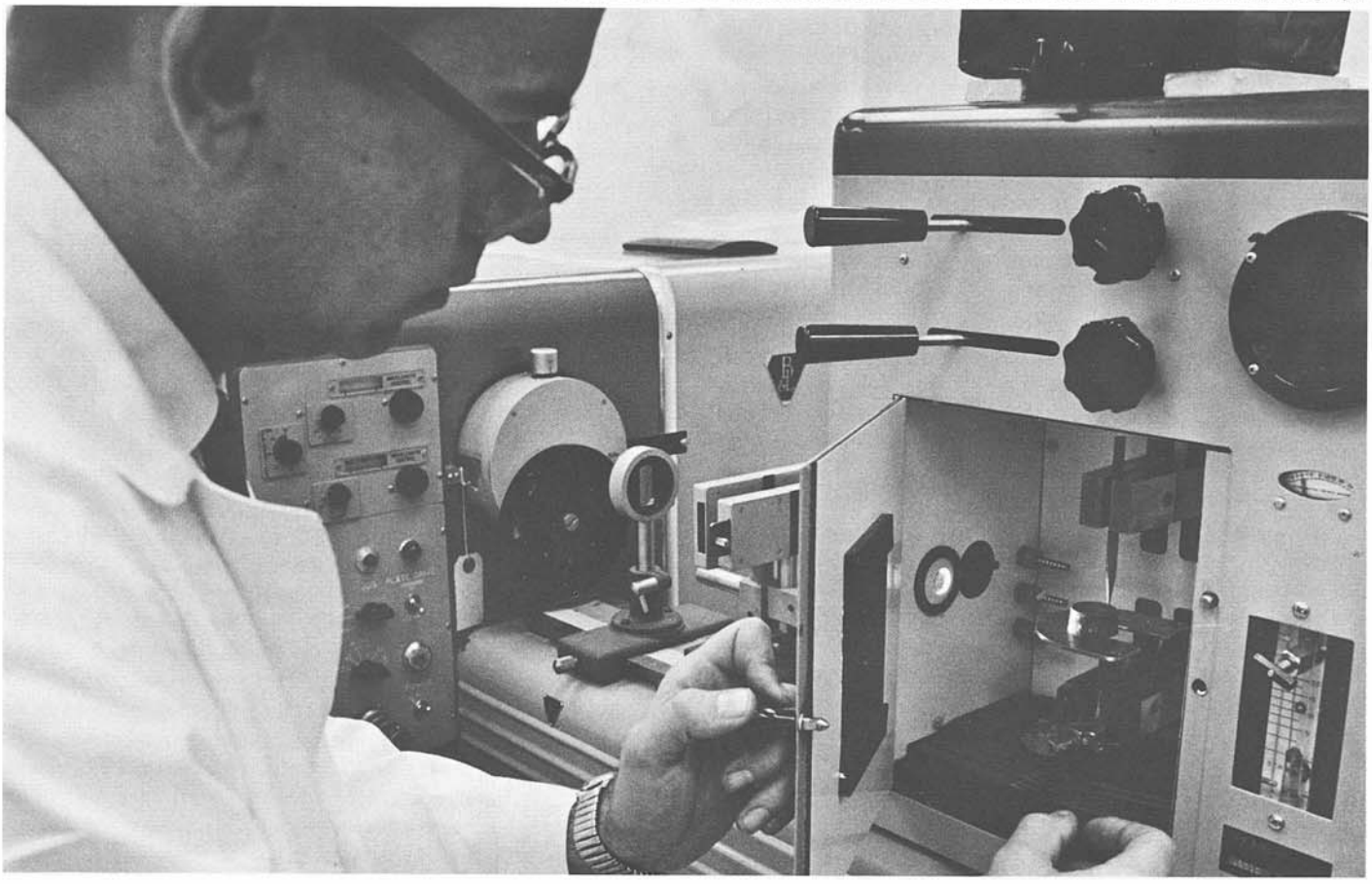
Development of molybdenum-base and tungsten-base alloys requires special tensile testing facilities to determine strength at temperatures up to 6000 F. Such tests are conducted using an electron-beam furnace to heat the specimen.

A 700-ton press for both extrusion and press forging (background) and air hammer (foreground), with their associated heating facilities, provide the versatile capability required for primary working of steels, molybdenum-base alloys, and tungsten-base alloys.



F. Lewellyn examines a specimen broken in the creep-rupture test machine.

Spectroscopist F. R. Fucek preparing to excite a steel sample in the emission spectrograph.



Spectroscopist - of - the - Month

J. Raynor Churchill

It is with great pride and pleasure that this issue of Arcs & Sparks features internationally known J. Raynor Churchill as Spectroscopist of the Month. His many accomplishments have made him one of the outstanding leaders in his field.

While a student at Carnegie Institute of Technology in 1929, Mr. Churchill joined the Analytical Chemistry Division of Alcoa Research Laboratories, Aluminum Company of America, New Kensington, Pennsylvania. At this time his father, H. V. Churchill, was also a member of the staff; this combination of father and son was very unusual in the Alcoa organization.

When we asked Mr. Churchill for permission to do this feature story he made only one request. We feel that this request can best be stated in his own words: "I would like to acknowledge the tremendous efforts of my many associates who contributed to the success of all these developments. These include many Alcoans and many Alcoa alumni who have retired or who have gone on to serve with distinction in other companies and laboratories. The list is so long that I will mention only one other than A. W. Petrey, namely, my father, H. V. Churchill. He was not only a top notch chemist but a brilliant executive and scientific statesman."

Mr. Churchill is presently Chief of the Analytical Chemistry Division of Alcoa, a position he has held since 1951. Since the beginning in 1929 his technical activities have covered a wide range. When asked where it began and what started this continuous search for new methods and systems, he answered, "I started my career in spectrochemical analysis accidentally when I was assigned to set up and operate the first spectrograph acquired by Alcoa. I have been chasing angstroms ever since. However, this activity has become increasingly diluted with forays into other areas of analytical chemistry, administrative activities and some preoccupation with the International Standards Organization."

During the first nine years with Alcoa, Mr. Churchill worked under the direction of A. W. Petrey (co-inventor of the Petrey Spark Stand). This period of his career was spent largely in the basic development of spectrochemical methods and equipment. It was during this period that his first breakthrough came. He introduced the use of graphite powder as an admixture in the analysis of powdered materials, especially those containing large amounts of aluminum, zirconium or other elements forming refractory oxides. Mr. Churchill explains this discovery by saying, "This technique, now commonplace, had apparently not been discovered by other analysts, partly because we were all beginners at that time and partly because high purity graphite powder was not readily available."

In the spectrographic analysis of metal, one of the controversial issues in the late 30's and early 40's was the choice between the rod-shaped self-electrodes and the point-to-plane system in which a graphite rod was used as a counter electrode. Mr. Churchill was the principal proponent of the point-to-plane system. It was through his research and efforts that this system was eventually adopted by the entire aluminum industry and much of the metal industry as a whole.

During this same period Mr. Churchill had been experimenting along another line which was creating controversy among leading authorities. The discussion centered around the electrical parameters best suited for the analysis of aluminum using high voltage spark. Some authorities insisted that a spark-like discharge of low self-induction was preferred and the best method. Mr. Churchill recommended a relatively high powered spark with unusually high self inductance because only such a spark would provide sufficient sensitivity of detection for certain elements of importance in aluminum analysis. No equipment of this type had ever been commercially available; therefore, it became necessary for Alcoa to design and build its own spark source equipment. It was some time before the instrument manufacturers could be persuaded to supply equipment providing for the desired parameters.

Mr. Churchill recalls that one of the highlights of this early work was the development of an unusual method for the routine analysis of aluminum. This method permitted recording the required spectrum lines of up to 300 samples on a single spectrum plate. The spectrum lines were then automatically measured on a recording densitometer designed especially for this purpose. The system was designed for mass production analysis and was extremely low in cost. It was used only in applications where elapsed time was relatively unimportant. The method was abandoned because of the eventual shift from historical analysis to control analysis. The above method has been described because it led to an accidental discovery of great importance. The rather complicated mechanized plate holder used in this method was

made almost entirely of aluminum, except for a few small parts made from other metals. On developing a spectrographic plate which had been allowed to remain in the plate holder over a week-end, Mr. Churchill was surprised to see a sharp image of the interior of the plate holder on the plate. He was fascinated by this phenomena and what began as mere curiosity became an extensive investigation. He found that what he had observed on the plate had been noted by many others engaged in photographic work. By now he was determined to find the answer and discovered that the sharp image he had observed was made by the production of hydrogen peroxide in the atmospheric corrosion of aluminum. He went on to study many other metals, correlating the occurrence of hydrogen peroxide with the various chemical and physical factors involved. This research resulted in the development of a general theory for the reaction mechanism.

The instrument now known as the Quantometer was developed jointly by Mr. Churchill and Dr. M. F. Hasler of Applied Research. It began as so many other great discoveries have: in a discussion in which their thoughts and ideas grew into workable sketches and drawings. The designing and construction of the instrument was jointly carried on by Alcoa and Applied Research. These instruments were first made exclusively for Alcoa, but became generally available from Applied Research soon thereafter. Today, virtually all aluminum on the world market is continually analyzed by equipment of this type. The Alcoa quantometric method is almost universally accepted with only superficial modifications.

Rare indeed, is the man who combines so many talents – scientist, administrator, designer and builder – but Mr. Churchill has encompassed each of these with enthusiastic success. Just prior to World War II, Mr. Churchill was made responsible for the development, application and administration of spectrochemical analysis on a company-wide scale. At this time Alcoa had more than 40 labs, plus plants operated by Alcoa for the federal government. His new appointment covered a wide variety of duties, including the designing of laboratories, the selection and installation of equipment, providing for standardizing the methods of operation, training personnel and overall technical administration. Mr. Churchill recalls that on an average he installed or supervised the installation of a new laboratory every two and one-half weeks for a period of about two years.

Mr. Churchill's experience and knowledge have been called upon numerous times in this country and abroad. Many such meetings have led to incidents, serious and amusing. It was during one such consultation that the name Churchill led to a case of mistaken identity that will always be among his best loved memories. During the war years when the destinies of England and the rest of the world were largely in the hands of Winston Churchill, the British admiralty asked Raynor Churchill to provide information and advice on spectrochemical methods. The admiralty was endeavoring to persuade the British defense industry to adopt American practices which they felt were superior to the methods then in use. A meeting representative of technical people was held in London. This meeting was attended by F. Twyman, the eminent spectroscopist and an ardent opponent of government interference with science and industry. When a speaker began his remarks with a statement, "I have here the recommendations of Mr. Churchill . . .," he was interrupted by Mr. Twyman who expostulated, "You mean that he is sticking his damn cigar into spectroscopy now?" Raynor Churchill admits to being a distant relative to Winston but doubts that the great man was aware of it.

Mr. Churchill was instrumental in the United States becoming an active member in the International Standards Organization. Being the first U.S. representative to attend a meeting of the ISO committees dealing with light metals and aluminum chemicals, he went on to organize two groups (see International Activities) which resulted in the U.S. becoming a participating member. Currently, he is involved in promoting the formation of an ISO group on bauxite. Mr. Churchill believes it would be in our national interest to see this work go forward rapidly and efficiently.

Mr. Churchill continues to be engaged in development of new and improved analytical methods on a broad scale. Much of his current effort is directed towards the automation of spectrochemical techniques and the marriage of analytical equipment with analog and digital computers of various types. Mr. Churchill emphasizes the growing importance of atomic absorption and X-ray fluorescence and his group is applying these techniques in a variety of applications. One of the objectives Mr. Churchill and his group hope to achieve in the near future is a dramatic improvement in the spectrochemical analysis of metals by radical change in the sampling and excitation system. Specifically, Mr. Churchill believes that the solid metal electrodes now used in most spectrochemical applications must be replaced by molten metal held at a temperature such as to place everything in solution. The main problem to be solved is the efficient conversion of a representative portion of molten metal to a vapor as a prelude to spectral excitation. Several possibilities are under investigation and he is very optimistic concerning the possibilities of an elegant solution.

It is regrettable that space limits us to touching only the highlights of the many contributions that Mr. Churchill has made to science. His work is known and respected throughout the world, but even more, he is admired and loved by those who call him "friend." No higher compliment can be paid any man.

TECHNICAL ORGANIZATIONS

A.C.S., Past Councilor, Past member of Analytical Chemistry Advisory Board.
S.A.S., O.S.A., Member
S.S.P., Past Chairman
ASTM/E-2 (Spectrochemical Analysis), Past Chairman
ASTM/E-3 (Chemical Analysis), Active Member
ASTM/E-15 and E-16, Chairman of Joint Subcommittee on Bauxite, Alumina and Related Chemicals.

INTERNATIONAL ACTIVITIES

Chief U.S.A. delegate to meetings of International Standards Organization dealing with chemical and spectrochemical analysis of light metals (ISO/TC 79/SC 1) and chemical analysis of alumina, cryolite and related chemicals (ISO/TC 47/WG 8).
Member of each of the U.S.A. National Committees for ISO/TC 79 and ISO/TC 47 and chairman of each of the supporting subgroups governing U.S.A. participation in TC 79/SC 1 and TC 47/WG 8.

at the

21st Annual International Symposium on Modern Methods of Analytical Chemistry

January 22-25, 1968 Louisiana State University
Baton Rouge, Louisiana

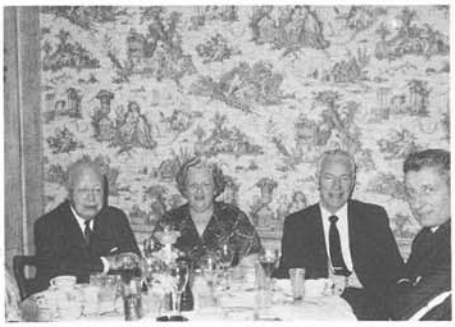
Dinner at Brennan's in the French Quarter in New Orleans is always a highlight of the LSU Symposium. The Captain at Brennan's (center) assists H. S. Bhacca (left), LSU; while Dr. G. Schwartzenbach (right), Professor of Chemistry, University of Zurich, Switzerland, looks on.

(L to R) Dean Sliger and Dr. Virginia Williams, both of LSU; Mrs. Choppin and Mrs. Sliger.

The couple at the left is Mr. and Mrs. Ivan Glaze (he's with American Cast Iron and Pipe Company); at right are Mr. and Mrs. Ray Plunkett (he's with Southern Railway Company). Two Ultra Carbon Corporation representatives in the center are Del Hughes (back) and Carl Leistner (seated).

Dr. F. J. Impastato (center) and Dr. D. W. Imhoff (second from right), both of Ethyl Corporation, and their wives chat with Mrs. Frank Iddings (left).

Fried bananas, anyone? Yes, said James W. Robinson, LSU. A waiter and the Captain are on hand to see that Jim doesn't make a "slip."

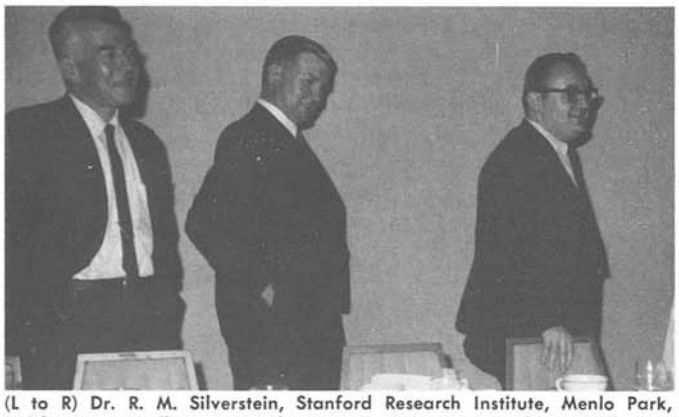


(L to R) Dr. Ralph H. Müller, LSU; and Mrs. Müller; Harry P. Kramer, U.S. Public Health Service; and Sidney Siggia, University of Massachusetts.

Dr. Schwartzenbach and Dr. P. F. Kane (right), Manager of the Central Analytical Chemistry Facility of Texas Instruments, Dallas, Texas.

More Ethyl Corporation representatives (left to right): J. W. Ryall, C. J. Arceneaux, R. L. Menville, R. A. Ashby and M. Tin.

(L to R) Mrs. M. J. D. Low, Mrs. Irwin H. Parrill and Mrs. Luis Vidaurreta.



(L to R) Dr. R. M. Silverstein, Stanford Research Institute, Menlo Park, California; Dr. Albert A. Smales, Atomic Energy Research Establishment, Harwell, Berkshire, England; and Dr. Barry L. Karger, Northeastern University, Boston, Massachusetts.

John F. Christman (right), Loyola University, seems to be testing one of Brennan's dishes for his wife and Frank A. Guthrie, Rose Polytechnic Institute.

Del Hughes (far left), Ultra Carbon, chats with (L to R): A. J. Veraguth, Lubrizol Corporation, Cleveland, Ohio; N. W. Ish, Carolina Chemicals, Inc., West Columbia, South Carolina; and M. Bozsih, Ferro Corporation, Cleveland.

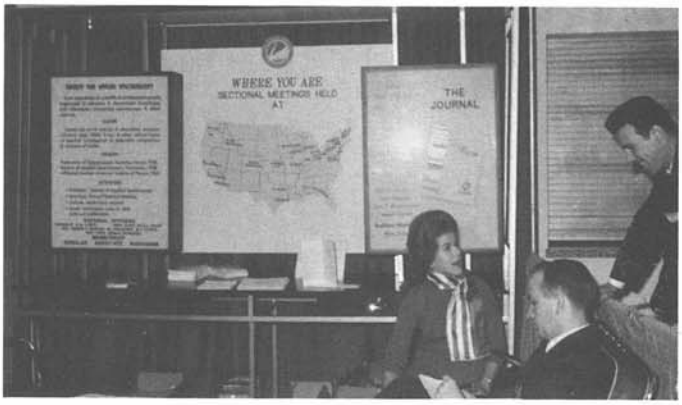
(L to R) Dr. R. M. Silverstein, Stanford Research Institute; Dr. Luis Vidaurreta, Coates Laboratories, LSU; Dr. James Robinson; Chancellor Taylor, LSU; and Dean A. R. Choppin, Dean of Chemistry and Physics, LSU.

(L to R) Mrs. Ayres; Mrs. West; Dr Philip W. West, LSU; Mrs. Luis Vidaurreta; and Dr. Gilbert H. Ayres, University of Texas.

(L to R) Frank A. Iddings, LSU; Patricia Barnes, LSU; and Leonard Newman, Brookhaven National Laboratories.

We at Ultra Carbon Corporation take this opportunity to thank Mr. Richard T. Oliver, President of the 19th Pittsburgh Conference, committee members and others who were responsible for the manner in which the transfer to Cleveland was handled. Imagine, if you will, the months of advance work and planning that had to be abandoned when the decision was made to change locations! To start over with the myriad of necessary details to attend to in only a few short weeks must have seemed an impossible undertaking. Credit and thanks must also go to William Chambers and Sarah Degenkolb, Cleveland Coordinators and the men and women on their committees. In the emergency this group shared the burden of developing and synchronizing all the necessary new arrangements. We cannot but admire the smoothness of the proceedings and the thoroughness in which we were kept informed of the necessary changes in the days preceding the conference. Again, our sincere thanks and admiration for an almost impossible task. Outstandingly well done!

Resting weary feet after viewing many of the fine exhibits are David N. Kendall (left), Kendall Infrared Labs, Plainfield, New Jersey; and Frank H. Straub, Texaco, Inc., Port Arthur, Texas.



Brightening up the SAS booth is Ruby Keeler, Shell Development Co., Houston, Texas. Seated is E. R. Shuster, Numec Corp., Lewiston, New York; standing at right is J. S. Heil, First Chemical Corp., Pascagoula, Miss.

R. Hansen (left), Continental Can Company; and Emil Pozi, Research Division, Texaco, Inc.

Enjoying the coffee break are Frances Heisler (left), Research Center, Texaco, Inc., Beacon, New York; and Lucy B. More, Pittsburgh Plate Glass, Corpus Christi, Texas.

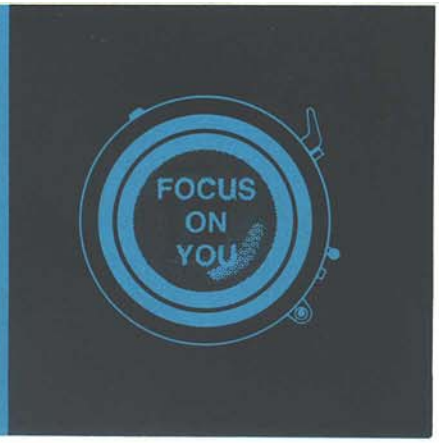
"This is how we do it," are probably the words of Del Hughes (second from left), Ultra Carbon Corporation. The audience includes John C. Neri (left) and Gordon VanSickle (right), both of U.S. Geological Survey, Denver, Colorado. Another Ultra Carbon representative is Marv Kusmierz (second from right).

Chatting with Donald R. Johnson (right), E. I. du Pont de Nemours and Company, Wilmington, Delaware, are Dr. and Mrs. Norman Jones from Ottawa, Ontario. He's with National Research Council.

at the

19th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy

Cleveland Convention Center
Cleveland, Ohio March 3-8, 1968



Harold Betters, well-known entertainer in the Pittsburgh area, kept things hopping in the Baird-Atomic suite.

H. Calkins (left) and W. Angelotti (right), both of Applied Research Laboratories, Glendale, California, with Hugh F. Beeghly, National Bureau of Standards, Bethesda, Maryland.

(L to R) R. W. Taylor, A. O. Smith Company, Milwaukee, Wisconsin; P. F. Griffin, Angstrom, Inc., Chicago, Illinois; and R. Falk, Midwest Instrument, Delafield, Wisconsin.

(L to R) W. A. Gordon, NASA Lewis Research Center, Cleveland, Ohio; Dr. Silve Kallmann, Ledoux and Company, Teaneck, New Jersey; and Judson Graab, also of NASA Lewis Research Center.

(L to R) W. A. Schilling, Kohler Corp., Kohler, Wisconsin; W. Falk, Midwest Instrument; Paul Kehres, A. O. Smith Company, Milwaukee; and R. Falk, Midwest Instrument.

Marshall Newcome (left), Morton Chemical Company, Woodstock, Illinois; and Ray Baney, Ultra Carbon Corp.

Charles W. Shafer (left) and Gerald Weiss, both of National Lead Company, South Amboy, New Jersey.

H.A. "Ben" Johnson, ARL, Toronto, Ontario; and C. J. Mitchell (right), Cominco, Ltd., Trail, British Columbia, Canada.

DR. R. NORMAN JONES
Honored at Pittsburgh Conference

Dr. R. Norman Jones of the National Research Council of Canada was selected this year to receive the 1968 Pittsburgh Spectroscopy Award, which is sponsored by the Spectroscopy Society of Pittsburgh. The award was made on March 6, 1968 during the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, held this year in Cleveland, Ohio. Dr. Jones was honored by the Society for his many distinguished contributions to molecular spectroscopy, for his work in applying computer techniques to spectroscopic problems, and for his activities on several important international commissions.

Dr. Jones was born in Manchester, England. He attended Manchester University, where he received the B.Sc. degree in chemistry in 1933, and the M.Sc. degree in physiology in 1934. In 1936 the University granted him the Ph.D. degree in chemistry for his work under the direction of the late Sir Ian Heibron on the chemical structure of vitamin D.

From 1936 until 1942 Dr. Jones was a Postdoctoral Fellow with Prof. L. F. Fieser at Harvard University. He then spent four years on the staff of Queen's University, Kingston, Ontario. He has been associated with the National Research Council of Canada at Ottawa since 1946. He is the Council's Principal Research Officer in charge of the Organic Spectrochemistry Section in the Division of Pure Chemistry.

In 1948 Dr. Jones was appointed a Fellow of the Royal Society of Canada.

His research work has principally been concerned with the use of ultraviolet and infrared absorption spectra in the elucidation of the molecular structure of organic compounds; his major interest centering about steroids, carotenoids, polynuclear aromatic hydrocarbons, n-paraffins, fatty acids and other long chain polymethylene compounds. His work on steroids has been especially extensive. More recently his field of interest has been extended to the measurements and interpretation of infrared band shapes in the liquid state; the application of computer oriented techniques to infrared spectrophotometry; and the Raman spectroscopy of complex organic molecules.

Dr. Jones is active in several international scientific organizations. He is chairman of the Molecular Spectroscopy Commission of the International Union of Pure and Applied Chemistry, and represents I.U.P.A.C. on the Joint Commission on Spectroscopy of the International Council of Scientific Unions. He is also a member of the ICSU-CODATA Task Group on Computer Use.

His scientific publications include approximately 170 journal articles, three monographs and two patents.

Mrs. Jones is a native of Hungary, so the couple's European roots take them abroad frequently. They have two sons. Dr. Jones' wit, good humor and warm personality have won him a host of friends, and his notable scientific accomplishments have earned the admiration of others in his profession.

Dr. R. Norman Jones (right) receives the 1968 Pittsburgh Spectroscopy Award from Professor Foil A. Miller (left). Dr. Jones, of the National Research Council of Canada at Ottawa, was cited for his outstanding contributions to the ultraviolet, infrared, and Raman spectra of large molecules, for his work in applying computer techniques to spectroscopic problems, and for his work on several important international commissions. The award was made during the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, held this year in Cleveland, Ohio.

THE PITTSBURGH SPECTROSCOPY AWARD

The Pittsburgh Spectroscopy Award was established in 1957 by the Spectroscopy Society of Pittsburgh. It is given annually to a distinguished spectroscopist from the United States or Canada. The Society confers the award in recognition of outstanding leadership in and significant contributions to spectroscopy, thereby endeavoring to encourage and advance study and research in this field. The award consists of a modest monetary sum and an illuminated scroll. It is traditionally presented during the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy.

The award has been presented to the following people:

1957	Dr. George R. Harrison	Massachusetts Inst. of Technlgy.
1958	Dr. Norman Wright	Dow Chemical Company
1959	Mr. Bourdon F. Scribner	National Bureau of Standards
1960	Dr. Alfred O. Nier	University of Minnesota
1961	Dr. Ralph A. Sawyer	University of Michigan
1962	Dr. Gerhard Herzberg	Nat'l Research Council, Canada
1963	Dr. William F. Meggers	National Bureau of Standards
1964	Dr. Foil A. Miller	University of Pittsburgh
	Dr. Robert A. Friedel	U.S. Bureau of Mines
1965	Mr. L. S. Birks	U.S. Naval Research Laboratory
1966	Dr. Richard C. Lord	Massachusetts Inst. of Technlgy.
1967	Dr. Maurice F. Hasler	Applied Research Laboratories
1968	Dr. R. Norman Jones	Nat'l Research Council, Canada

Summer Courses Offered

Catholic University of America, Washington, D.C.

An introductory course on the theory and interpretation of Mossbauer Spectroscopy will again be offered at the Catholic University of America during the week of June 17, 1968. Leading investigators in the field will serve as lecturers. Topics to be covered include the theory, instrumentation, and application to chemistry, metallurgy, nuclear and solid state physics and biology. Various types of spectrometers will be available to those attending. The fee is $130. For further information, contact Dr. Leopold May, Department of Chemistry, Catholic University of America, Washington, D.C. 20017.

Arizona State University, Tempe, Arizona

Two different and distinct courses in spectroscopy are offered.

July 29 - August 2, the eighth annual program in Infrared and Ultraviolet Absorption Spectroscopy — $150.00.

August 12 - 23 the thirteenth annual program in Modern Industrial Spectroscopy denoted principally to optical emission techniques — $250.00.

Both programs are designed for chemists and others from industrial laboratories which make use of spectrophotometric and spectrographic equipment respectively. These intensive courses of lectures and practical laboratory work serve to train personnel to staff these installations. For complete information write: Dr. Jacob Fuchs, Director Modern Industrial Spectroscopy, Arizona State University, Tempe, Arizona 85281.

Publication Announcement

Revision of the NBS Tables of Spectral-Line Intensities Below 2450 A

by Charles H. Corliss, National Bureau of Standards Monograph 32 Supplement, issued July 7, 1967; 33 pages; 30 cents. (Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151; or from local U.S. Department of Commerce Field Offices.) W. F. Meggers, C. H. Corliss, and B. F. Scribner authored Part I and Part II of the NBS Tables of Spectral-Line Intensities in 1961. In these two publications, the relative intensities of 39,000 spectral lines with wavelengths between 2000 A and 9000A were presented by element (NBS Monograph 32, Part I) and by wavelength (NBS Monograph 32 Part II). The present publication is a supplement to those two volumes.

L. S. Birks Awarded SAS New York Section Medal

New York Section Medal

The 1967 medal of SAS, N.Y. Section was awarded to L. S. Birks at the Eastern Analytical Symposium. Mr. Birks has made many contributions in the fields of x-ray spectroscopy and election probe analysis. Presenting the award was Paul Lublin of General Telephone & Electronics Laboratories, past chairman of the N.Y. Section.

May

7th National SAS Meeting to be held May 13-17, 1968, at the Chicago Sheraton Hotel, Chicago, Illinois. The preliminary program indicates the following subjects will be covered:

1. Internal Reflection Spectroscopy and Polymer Spectroscopy.
2. Flame and Atomic Absorption Spectroscopy.
3. X-Ray Spectroscopy — Open Seminar and Problem Solving Session.
4. Far Infrared Spectroscopy.
5. Three Decades of Emission Spectroscopy.
6. Mass Spectroscopy.
7. Spectrochemical Applications in the Analysis of Textiles and Fibers.
8. Characterization of Surfaces.
9. Emission Spectroscopy in Biology.
10. Nuclear Magnetic Resonance.
11. Nuclear Particle and Gamma Ray Spectroscopy.
12. Raman Spectroscopy.
13. Uses of Spectroscopy in Geology.
14. Gas Chromatography.

12th Annual May Conference of the Cleveland ACS — May 22, 1968 at John Carroll University, University Heights, Ohio.

August

10th Annual Rocky Mountain Spectroscopy Conference — August 19 and 20, 1968 at the Denver Hilton Hotel, Denver, Colorado.

Denver Conference on Application of X-Ray Analysis — August 21, 22 and 23, 1968 at the Stanley Hotel, Estes Park, near Denver, Colorado.

1968 Standards Laboratory Conference — August 26-29, at the Boulder Laboratories of the National Bureau of Standards, Boulder, Colorado.

November

Pacific Conference on Chemistry and Spectroscopy — November 6-8, 1968, at the Jack Tar Hotel, San Francisco, California.

10th Annual Eastern Analytical Symposium — November 13-15, 1968, at the Hotel Statler Hilton, New York City, New York.

Special Announcement

The Florida Symposium on Spectroscopy will be resumed in 1969. The dates selected are January 8, 9 and 10. A preliminary program with abstract will be mailed in October of this year. Advance information may be obtained by writing to Professor William T. Tiffin, Department of Metallurgical and Materials Engineering, University of Florida, Gainesville, Florida 32601.

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