ARCS & SPARKS

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for the advancement of Spectroscopy

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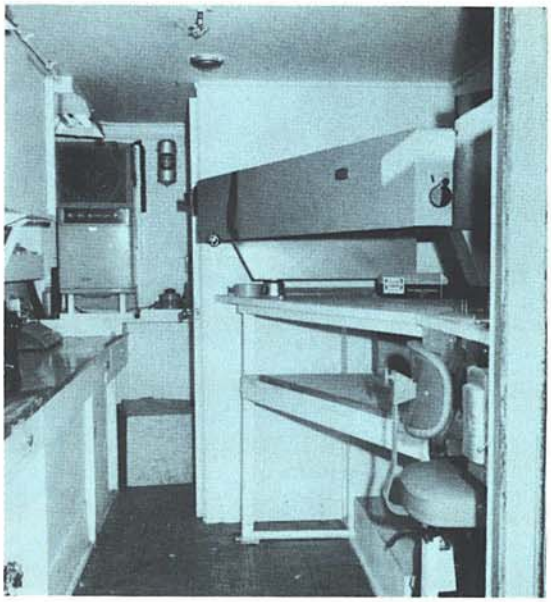
UNITED STATES GEOLOGICAL SURVEY LAB ON WHEELS

What's this issue all about?

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.

COVER STORY

This is one of three mobile spectrographic units operated by U.S. Geological Survey for extensive mineral evaluation in primitive areas of the western United States. A crew of four may analyze as many as 120 samples per day for 30 elements.



Interior of the mobile laboratory mounted on a standard three-ton truck chassis.

Labora-Story of the Month

UNITED STATES GEOLOGICAL SURVEY

Department of the Interior

Denver, Colorado

Spectroscopy Laboratory on Wheels

A little over a hundred years ago thousands of men sweltered under a hot California sun while panning for gold. Most were completely ignorant of everything connected with mining and precious metals. Their battered boots and hats to match were trademarks. They ate bully beef, beans and pork, drank whisky and washed when the fleas got too bad. The cry was "Gold!" as the manufacture of shovels and pickaxes soared and the male population virtually disappeared in cities and villages which dotted the West Coast.

Compare this with "prospecting" today. Four men set out from Denver in a 12-foot van-type truck mounted on a standard 3-ton truck chassis. Inside the truck is a modern spectrographic laboratory serving as an important tool in research on the chemistry of mineral deposits and assisting in geochemical prospecting for concealed ore bodies. The men are college-trained and thoroughly knowledgeable in the art of "prospecting." They are comfortably dressed and not lacking in a nutritious diet. The call of rugged, outdoor living has always been an attraction to man. But so has the call of useful research. Combining the two is indeed rare, but the U. S. Geological Survey is doing just that with its spectrographic laboratory on wheels.

The laboratory permits on-the-spot analyses of samples, enabling geologists to plan and maintain an effective sampling program that supplements and keeps pace with the progress of other field studies. Presently, the mobile spectrographic laboratory is providing analyses of selected samples of rocks and ores to support economic evaluations of the mineral resources of the primitive and wilderness areas in the United States.

Electric power for the laboratory is supplied by two motor-generator plants mounted on a tow trailer. One generator supplies 220 volt dc for the arc source, and the other supplies 110 volt ac for lights and accessories. Two stainless steel water tanks with a combined capacity of 120 gallons permit the laboratory to operate for extended periods and also serve to balance the weight of the spectrograph and other heavy items, an important factor when the unit is moving, particularly on mountain roads.

The spectrographic equipment consists of a 1.5 meter spectrograph containing a 15,000-line-per-inch replica grating that covers the wavelength range from 2060 to 4840 Angstroms in the second order on a 20-inch length of film. A custom-built dc source unit and a custom-built spark unit supplies the current to a water-cooled arc stand.

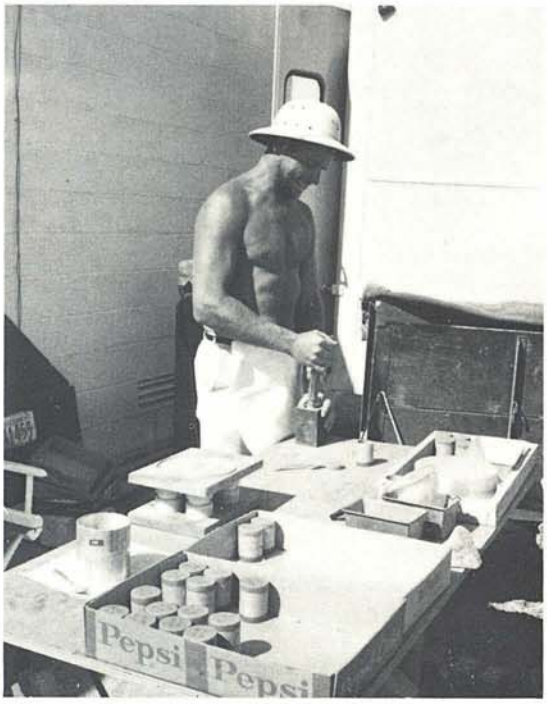
The film processing unit is a completely self-contained bench model which is housed in a darkroom at the front

(Continued on next page)

Gordon Van Sickle, chemist on the team, is putting rock samples in a final solution prior to atomic absorption analysis to determine gold content.

Kam Wo Leong, chemist, ignites samples of rock prior to gold analysis by atomic absorption.

Kam holds the official flag of the Geological Survey.



Final stage of sample preparation prior to analysis is made by Harley King, Geologist.

For field trips into areas that are relatively easy to enter these two laboratory vans are used together. Two men, one per truck, make the trip with these units. The weighing room, darkroom and office are housed in one (foreground), and the spectrographic laboratory in the other.

SPECTROSCOPY LABORATORY ON WHEELS / Continued

of the van. Cold water needed to maintain the constant temperature bath in the film processor and for the arc stand is supplied by a refrigeration unit and circulated by centrifugal pumps.

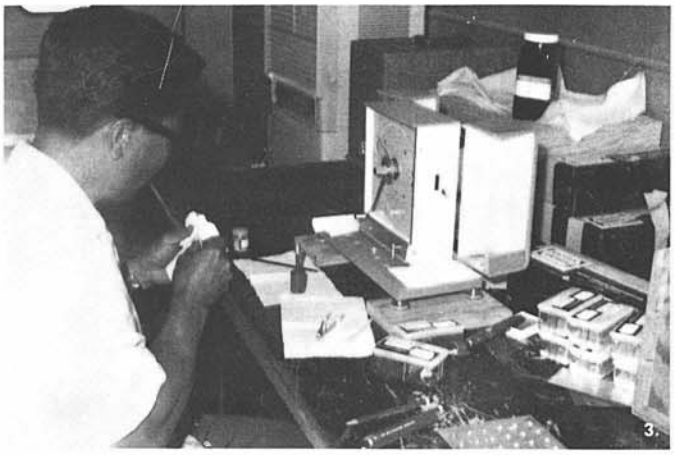
A unit for the appraisal of the spectrograms, a comparator of 20X magnification, permits the visual matching of unknown and standard spectra.

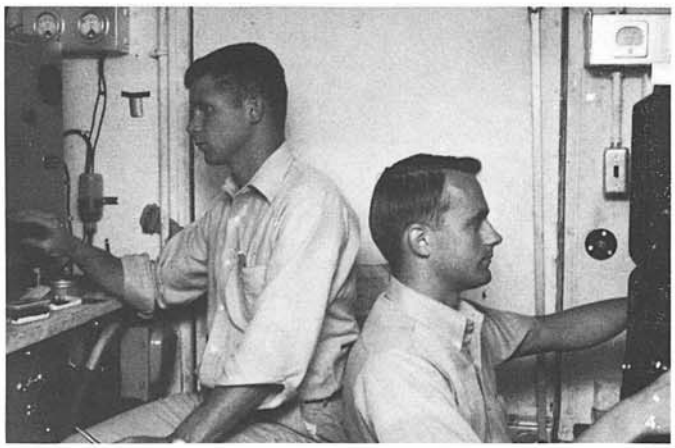
To date the mobile spectrographic laboratory has traveled over 50,000 miles to sites of more than 30 field projects in 12 Western States, and in support of these projects has furnished semiquantitative data for over 80,000 samples.

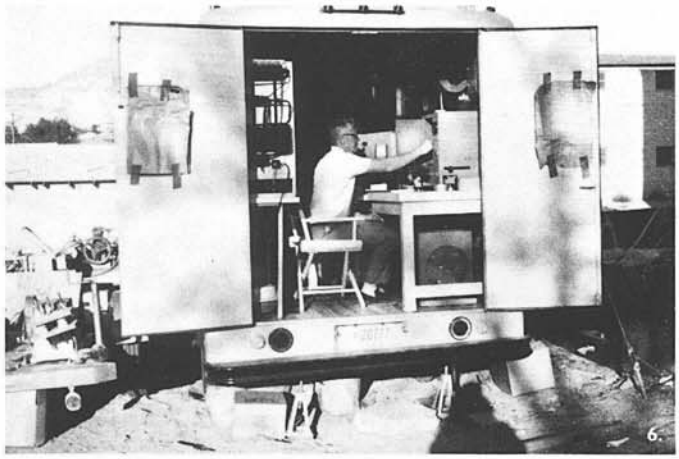
Coming up in the next issue

Feature story on Dr. Marvin W. Skougstad of U. S. Geological Survey, Denver, Colorado, who has completed his term as President of the Society for Applied Spectroscopy.

WATCH FOR IT







1. Tom Gann Ging, Jr., is reading a sample for gold analysis by atomic absorption.
2. Elwin Mosier, spectrographer, uses the jaw crusher to break up rock into the proper size particles for further preparation in the ball mill.
3. Pulverized rock samples are weighed in the crater electrode prior to dc arc excitation. James Nishi, spectrographer, does the job.
4. David Grimes (right), chief spectrographer, interprets the spectra in ppm, while Arnold Farley, spectrographer, is arcing the sample.
5. Kam Wo Leong analyzes mercury in rock with the mercury vapor detector.
6. This is the inside of the small (1.5 ton) laboratory truck. Elwin Mosier is at the excitation stand of the 1.5 meter Wadsworth.
7. Al Marranzino is making adjustments to the mobile motor generator unit which is used to power all facilities for dc and ac electrical power generation. The equipment contains two units — 6 kw per unit. Tom Ging is reading the power panel (standing at right).

This is one of the last photographs taken of Jim Oda whose death on December 27, 1965, was a great loss for all of us. Below is the Meritorious Service Award presented to his family by Secretary of the Interior.

CITATION

For Meritorious Service

UTEANA ODA

posthumously, in recognition of pioneering accomplishments and professional dedication and ability in the science of field spectroscopy.

Mr. Oda joined the Geological Survey in 1955 entering immediately into the field of minerals exploration. At that time the science of spectroscopy was established in a conventional laboratory environment, but practical application of spectrographic analysis under isolated field conditions was totally nonexistent. Mr. Oda, recognizing the deficiencies of existing fixed analytical techniques, determined to develop mobile laboratory equipment and techniques designed to permit field spectrographic analysis. His highly successful pioneering efforts in the years that followed culminated in his developing a completely operational, practical mobile field spectrographic laboratory. His dedicated application of scientific ability resulted in the establishment of field spectrographic analysis with optimum analytical precision, sample contamination control and rate of analysis. It is not, primarily, the intrinsic value of Mr. Oda's accomplishments which are noteworthy, although these were substantial in the scientific programs of the Geological Survey, but rather it is the lasting scientific contributions to the new area of field spectroscopy which distinguished Mr. Oda's professional career. For his dedication to and furthering of the scientific programs of the United States, the Department of the Interior confers on Mr. Oda, posthumously, the Meritorious Service Award.

Stewart L. Udall

SECRETARY OF THE INTERIOR

at the

12th Louisiana State University Symposium on Modern Methods of Analytical Chemistry

January 23-26, 1967

Professor James H. Wharton (left), Louisiana State University, was a symposium speaker on Electron-Probe Micro-Analysis. Also shown above (left to right) are Mrs. Wharton, Mr. and Mrs. Eugene W. Berg, and Mrs. Viduarreta and Mr. Luis Viduarreta, all of LSU.

Exhibit Chairman for the LSU Symposium was Dr. E. L. Steele (left), Louisiana State University; shown next to him (clockwise) are Mrs. Steele; Professor J. R. Dyer of Georgia Institute of Technology, speaker on "Combined Gas Chromatography Mass Spectrometry," and "Nuclear Magnetic Resonance Spectroscopy;" Arnold Levitt, representative of **Chemical and Engineering News**; Mrs. James W. Robinson and Mr. Robinson; and Dr. E. H. Siegler, Jr., The Perkin-Elmer Corporation, Norwalk, Connecticut, speaker on "Laser and Raman Spectroscopy."

Southern hospitality seems to agree with (left to right) Mr. and Mrs. Ivan Glaze, ACIPCO; Mr. and Mrs. Roy Plunckett, Southern Railway; Gene Roberts, Jarrell-Ash Company; Carl Leistner, Ultra Carbon Corporation; and Joe Guidry, Freeport Sulfur Company.

Program Chairman for the LSU Symposium was Professor James W. Robinson (right), of Louisiana State University. Dr. J. T. McCall (left), Mayo Clinic, spoke on "Trace Metals in Disease." Dr. Fred Brech (center), Jarrell Ash Company, Waltham, Mass., another speaker, chose as his topic, "A Revolution in Spectrochemical Analysis, both in Instrumentation and Application." The charming ladies are Mrs. McCall and Mrs. Robinson.

Enjoying the cuisine at Brennan's French Restaurant in New Orleans are (clockwise from foreground) Susan Freshwater; Dr. Ralph H. Muller, Albuquerque, New Mexico, consultant in analytical chemistry who spoke on "Fluorescence," and "Nuclear Techniques" at the Symposium; Mrs. Kane and her husband, Dr. P. F. Kane, Texas Instruments, Inc., Dallas, Texas, speaker on "Analytical Chemistry in Semi-Conductors Materials Research;" Mrs. West and her husband, Professor Philip W. West, Louisiana State University; and Harry Kramer, U. S. Public Health Service, Washington, D. C.

Nick Christ, Bob Bliss and Clyde Hawkins (left to right), all of Reynolds Metal Company, enjoying a conversation with Joe Weber of National Bureau of Standards.

United States Geological Survey, Denver, Colorado, was well represented by (left to right) Harry Nakagawa, G. Van Sickle, and Kam W. Leong (see Labora-Story of the Month).

Thank Heaven for little girls like Lucinda Owen. Proud Papa is Louis E. Owen (right), Tomorrow Enterprises. That's Professor Fassel of Iowa State University on the left.

On camera are (left to right): Eugene R. McGough, Kermac Potash Co., Hobbs, New Mexico; Michael Maziarski, Beechnut-Life Savers, Inc.; Roy Ko, Battelle Northwest, Richland, Washington; Ronald Lambek and Dennis G. Gillen, both of Monsanto Research, Miamisburg, Ohio.

Resting tired feet are (left to right) Del Hughes, Ultra Carbon; Sally Scribner and husband, Bourdon, of National Bureau of Standards; Mrs. Jane Sheridan, Hoffman LaRoche; D. B. Sharpe, Center for Forensic Sciences, Ottawa, Canada, and Mrs. Sharpe.

Ray Baney of Ultra Carbon Corporation (right) seems to be fixing up something special for Elwin Davis, Sinclair Research Labs, Harvey, Illinois.

Record Attendance

The 18th Pittsburgh Conference was held the week of March 5 with over 5,000 registrants. A meeting this large doesn't just plan itself and many thanks should go to the Board of Directors of the 1967 Conference, headed by Frank E. Dickson, for the magnificent job of coordinating the program. Their supreme efforts certainly made the meeting more beneficial and more enjoyable for all. No wonder everyone looks forward to Pittsburgh every year and the crowds get bigger and bigger. In 1968 the meeting dates are March 4-8. See you there.

Coblentz Award

The Coblentz Society presented the 1967 Coblentz Award to Dr. Peter J. Krueger, University of Calgary, Calgary, Alberta, Canada. Dr. Krueger's paper was titled, "Application of Infrared Spectroscopy to Conformational Problems in Some Simple Molecules." Dr. Nelson Fuson, President of the Coblentz Society, presented the award during the Van Zandt Williams Memorial Symposium. Theme of the Symposium this year was, "Where Does Infrared Spectroscopy Go From Here?"

Pittsburgh SAS Honors Dr. Maurice F. Hasler

The Spectroscopy Society of Pittsburgh, Pittsburgh, Pennsylvania, presented the 1967 S.S.P. Award to Dr. Maurice F. Hasler, Director of Research and Development of Applied Research Laboratories, Incorporated, during the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy.

This is the eleventh award that the Spectroscopy Society of Pittsburgh has given to a world-renowned spectroscopist.

Dr. Hasler, author of approximately 50 scientific papers, has made significant contributions to the fields of emission, X-ray, and electron microprobe spectroscopy. The title of the award address by Dr. Hasler was, "Cybernation in Spectrochemistry."

SAS Members Organize SOS Club in Pittsburgh

One of the most exclusive dinners ever held took place one night during the Pittsburgh Conference. On March 9, 1967, at the University Club, a dinner was held by the Society for Older Spectroscopists (SOS). This elite group will probably make it an annual affair, but it's difficult to guess if they'll be swamped for memberships.

It's indeed an honor to be connected with the group, but on the other hand . . .

The shutterbug was busy during the dinner and the photos may be as close as some of us will ever come to partaking in this and future glorious dinners.

SOS members include: (seated, left to right) J. Raynor Churchill, Alcoa Research Laboratory; Mabel Wilson, Allied Chemical; Paul Hutchinson, Perkin-Elmer; Alan Goldblatt, Angstrom, Inc.; Sarah Degenkolb, U.S. Steel; Sam Damian, U.S. Steel; Julia Senko, Westinghouse Research; Sally Scribner; Ed Van Dien; Alfred T. Myers, U.S. Geological Survey; Mary Warga, OSA; Velmar Fassel, Iowa State University; and Fred Brech, Jarrell-Ash Company. Standing: Bourdon Scribner, National Bureau of Standards; Bruce LaRue, National Steel Corp.; Bill Davis, MacPherson Instrument, Inc.; John Norris, Baird-Atomic, Inc.; Neil Gordon, Jr., Westinghouse; Dick Jarrell, Jarrell-Ash Company; Joe Woodruff, Armco Steel Corp.; Ray Russell, Olin Matheson; Bill Kennedy, ACIPCO; Robert Michaelis, NBS; Joe Irwin, American Brass; Charles North, National Lead Co.; Bernie Boyd, Angstrom, Inc.; Len Eikren, Applied Research Laboratories; Carl Leistner, Ultra Carbon Corp.; D. P. Bartell (retired); and R. K. Scott, Harbison-Walker Refractories.

Spectroscopist - of - the - Month

Alfred Tennyson Myers

This year marks the completion of 20 years of service in spectrochemical research by Alfred Tennyson Myers for The Department of Interior, the U.S. Geological Survey at the Federal Center in Denver. For the past 17 years he supervised the Spectrographic Services and Research Project in the Geologic Division.

It is our pleasure to feature him at this time as Spectroscopist of the Month and we're sure all his many friends will join us in wishing him many more years of fruitful research in the field of spectroscopy.

Born in Edinboro, Pennsylvania, on April 6, 1903, Mr. Myers began his higher education at the University of Maryland. Majoring in chemistry, he earned his B.S. Degree in 1920 and a M.S. Degree in biochemistry in 1943.

His professional career began (in 1926) with the Bureau of Plant Industry of the U.S. Department of Agriculture at Arlington Farms, Virginia, transferring later to the Beltsville Farms in Maryland.

In the Department of Agriculture he was involved in many biochemical studies related to the utilization of fruits and vegetables. Beginning about 1936 Tennyson Myers applied spectrographic methods to numerous problems of horticulture, and to mineral nutrition studies by "leaf analysis" for trace elements. At the Beltsville Farms he made valuable contributions to spectrochemical techniques and to greenhouse plant nutrition studies. His early work on a carbon electrode shaping tool preceded the development of the present large industry for preformed electrodes. Perhaps the most significant contribution to agriculture concerned a study of "Nutrient element balance of the tung tree grown in sand culture," where modern leaf spectrographic analysis was combined with a modern statistical greenhouse sand culture experiment. For the first time in plant nutrition work, an experiment was designed for observing the effect of multiple element absorption by plants in sand culture, including "leaf analysis" for 11 elements.

An opportunity was extended to Mr. Myers to transfer to the Department of Interior in 1947 to join the research staff of the U.S. Geological Survey, for spectrochemical and geochemical research in the Geologic Division. His

experience and training in geology and geochemistry were significantly broadened by association with K. J. Murata, and in spectrochemistry by association with A. W. Helz of the Geological Survey in Washington, D.C. Later, transferring to the Survey's regional laboratory in Denver, Colorado, with the help of P. R. Barnett, P. J. Dunton and R. G. Havens, he developed spectrographic methods for the determination of minor and trace elements in A.E.C. raw materials from the Colorado Plateau. During the Colorado Plateau "uranium" search (a cooperative operation between the A.E.C. and the U.S. Geological Survey from 1948 to 1957) Mr. Myers supervised both the Denver spectrographic laboratory, and a project on the occurrence of "Uranium and Trace Metals in Asphalt and Petroleum." Both of these projects required a broad grasp of spectrochemistry and of organic and inorganic chemistry, as well as an understanding of geological and mineralogical problems to which they apply.

Tennyson Myers has enlarged the scope of his activities with the Survey by anticipating the need by geologists for new and different types of spectrographic data. Under his guidance, a six-step (semiquantitative) technique of spectrographic analysis was developed for the analysis of geological materials. Although precise data are frequently needed for many geological studies, there is an even greater need for a larger mass of data, obtained by rapid procedures, for use in a statistical approach in detailed studies of the distribution of elements and in geochemical prospecting. The six-step technique developed by Mr. Myers meets the need for mass production of data on the composition of geological materials. This has led to the development of mobile spectrographic laboratories (also under his technical direction) which are now in use in a broad Geochemical Exploration program.

Since working with the U.S. Geological Survey, Mr. Myers has made important studies of contamination in grinding and sampling, of improved spectrographic techniques, and of the distribution of trace metals in such diversified materials as soils, rocks, minerals, vegetation, crude oil, asphalt and petroliferous rocks. He has been joint author with geologists and mineralogists on many studies of geologic and geochemical importance.

The "Uranium and Trace Metals in Asphalt and Petroleum" project was discontinued in 1957 at the end of the Colorado Plateau "uranium" search. The project for Spectrographic Services and Research, however, remains under Mr. Myers leadership in the Branch of Analytical Laboratories of the Geologic Division in Denver. This project has expanded its analytical routine and research program to give increased support to the Heavy Metals and other programs of the Survey.

During February, March and April of 1966, Mr. Myers (with Mr. L. F. Rader, Jr. also USGS) acted as consultant for the Mineral Resources Survey Project of the Republic of Colombia in Bogota, Colombia. The objective was to assist the Colombian government in the establishment of a geochemical laboratory at the Servicio Geologico Nacional in Bogota. Working closely with the Director of the Mineral Resources Survey, Dr. Dario Suescun G. (and Earl Irving, USGS counterpart), a long and complete list of apparatus, chemicals and laboratory furniture was prepared including an atomic absorption spectrometer and a small but modern spectrograph. Approximate prices were obtained for all equipment and recommendations were made for installation of the proposed geochemical laboratory, which is scheduled for completion later this year.

An extremely important operation for the Survey is now underway under Mr. Myers' supervision. A multichannel direct reading spectrometer for determining 40 minor and trace elements in rocks has been installed and its routine operation is underway in the collection of basic trace element data for silicate rocks. Read-out equipment has been added for automatically recording data directly in element concentration. Provision has also been made in the system for convenient utilization of the data in various forms of automatic computations. These developments have had the very effective help of R. G. Havens, N. M. Conklin, J. Ohm, Lorraine Lee and others.

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A. T. Myers, R. G. Havens, and N. M. Conklin, (1963). Application of direct reading spectrometry for the determination of trace elements in silicate rocks, Abstract GSA, Rocky Mt. Section, Albuquerque, New Mexico, May.

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LOOKING AHEAD

OTTAWA, CANADA, will be buzzing June 19 thru 23 when the XIII Colloquium Spectroscopicum Internationale will be held. Canada's most eminent spectroscopist, Dr. Gerhard Herzberg, F. R. S., will open the ceremonies with a keynote address at one of the lecture halls at Carleton University. More than 130 papers will be given by scientists from 22 countries. Coinciding with the Centennial celebrations in Canada, the meeting incorporates the 6th National Meeting of SAS (USA) and the 14th Annual Canadian Symposium on Applied Spectroscopy.

DENVER, COLORADO will host the Ninth Annual Rocky Mountain Spectroscopy Conference on August 7-8 at the Albany Hotel. Sponsored by the Rocky Mountain Section of SAS, the meeting immediately precedes the Annual Denver Research Institute X-ray Conference which will be held August 9-11. The Ninth meeting will feature technical papers on recent developments in the field of spectroscopy, including optical and X-ray emission, atomic absorption, infrared, and mass spectroscopy. A banquet and social hour will be held on Monday evening, August 7. For information, contact Chairman of the meeting, Robert Brennan, U. S. Geological Survey, Denver Federal Center, Building 25, Denver, Colorado 80225; or Russell E. Lewis, Marathon Oil Company, 7400 S. Broadway, Littleton, Colorado 80120.

TORONTO, CANADA, has been selected by the Chemical Institute of Canada for its meeting June 5-6-7, 1967. The Royal York Hotel will host this fine group.

DETROIT, MICHIGAN, is the place to be from October 3 to 5 when the 1967 Anachem Conference will be held at the Statler Hilton Hotel. This year marks the silver anniversary of the Association of Analytical Chemists who sponsor the program in collaboration with the Detroit Section of the Optical Society of America. Special symposia, an exhibit of new instruments and equipment, nationally known analytical chemists speaking on a wide variety of subjects, and presentation of the ANACHEM AWARD make up the outstanding program planned. Address inquiries to: Roger E. Marce, Allied Research Products, Inc., 400 Midland, Detroit, Michigan 48203.

GATLINBURG, TENNESSEE, again is preparing to host the Conference on Analytical Chemistry in Nuclear Technology. The Eleventh Conference is scheduled for October 10-12 at the Mountain View Hotel in Gatlinburg under the sponsorship of the Analytical Chemistry Division, Oak Ridge National Laboratory which is operated by Union Carbide Corporation for the U. S. Atomic Energy Commission. Conference theme this year is "Instrumental Methods in Analytical Chemistry." Any inquiries concerning the Conference, including requests for programs, write Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee 37830, Attention: L. J. Brady, Chairman. Reservations for lodging should be made direct to the Mountain View Hotel in Gatlinburg.

NEW YORK CITY, always a favorite meeting spot, hosts the ninth Eastern Analytical Symposium on November 8-10. The Symposium is sponsored jointly by the Analytical Groups of the New York and North Jersey Sections of the American Microchemical Society and the Baltimore-Washington, Delaware Valley, New England and New York Sections of SAS. A series of three-hour symposia of invited papers of extended lengths will be presented. In addition to the scientific program, 90 exhibitors will feature the latest in scientific apparatus and supplies. There will be a social mixer Thursday evening. An employment bureau will operate daily and technical films will be shown continuously during the meetings at two separate locations. For further information on the EAS, contact Publicity Chairman George L. Davis, Dalare Associates, 2300 Locust Street, Philadelphia, Pa. 19103.

ANAHEIM, CALIFORNIA, has been picked by the Southern California Section of the American Chemical Society and the Southern California Section of the SAS for the Pacific Conference on Chemistry and Spectroscopy. The dates are October 30-31 and November 1. The conference, being held at the Disneyland Hotel, includes the Third Western Regional Meeting of the ACS and the Sixth Pacific Meeting of the SAS. Program Co-Chairmen are: E. Milton Wilson (ACS), Aerojet-General Corporation, Von Karman Center, 1100 W. Hollyvale Avenue, Azusa, California 91702; and Walthew T. Barnes (SAS), General Dynamics Corporation, P. O. Box 2507, Plant Mail Zone 6-56, Pomona, California 91766.

FISK INSTITUTE'S 18th Annual sessions have been announced as follows: First week, August 14-19, IR Spectroscopy and Gas-Liquid Chromatography (both covering basic theory and techniques); second week, August 21-25, Interpretation of Infrared Spectra (lectures and workshops), and Ultraviolet-Visible Spectroscopy (basic theory and techniques). Sessions are scheduled so that attenders who prefer may attend all lectures of both sessions or all lab programs of both sessions. Tuition fee is $150; registration, $10. For applications and information contact the Fisk Institute Director, Box 8, Fisk University, Nashville, Tennessee 37203.

ARIZONA STATE UNIVERSITY again offers two different short courses in spectroscopy. The seventh annual program in Infrared and Ultraviolet Absorption Spectroscopy will be July 31 - August 4; the 12th annual program in Modern Industrial Spectroscopy will be August 14-25. These are designed for chemists and others from industrial laboratories which make use of spectrophotometric and spectrographic equipment respectively. The courses serve to train personnel to staff these installations. Members of the university staff and guest lecturers from industrial laboratories make up the instructional staff. For complete information write to Dr. Jacob Fuchs, Director, Modern Industrial Spectroscopy, Arizona State University, Tempe, Arizona 85281.

DETROIT, MICHIGAN, also looks forward to the 1967 Annual Meeting of the Optical Society of America. Scheduled for October 10-13 at the Sheraton-Cadillac Hotel, the meeting is being arranged with the cooperation of the Detroit and Ann Arbor Sections. Invited papers will cover the topics of non-linear optics, optical data processing, dynamic seeing concepts, universal optical phenomena, optical instrumentation, absolute radiometric measurements and optical research in small colleges. Harlan H. Hatcher, President of the University of Michigan, will talk on "Advancement of Science in the Midwest." The University is celebrating its 150th year in 1967.

Program Committee members shown below are: (seated, left to right) Bruce Preston; Dick Majkowski, vice chairman in charge of hotel liaison; Harry Veldhuis; Dave Fry, program committee chairman; Wally Lesnick, finance subcommittee chairman; George Zissis, sessions subcommittee chairman; and Yeong Kim. Standing, left to right: Vic Lindberg; Duane House; Carl Leistner, registration subcommittee chairman; Harry Edwards; John Vandenbelt; Fred Phelps III, special events subcommittee chairman; Phil Mahan; Ed Boettner, banquet subcommittee chairman; Emmett Leith; D. J. Lovell, major themes subcommittee chairman; Allan Becker, Harry Dryer; and Ford Bryan, publicity subcommittee chairman.

ULTRA CARBON ANNOUNCES EXPANDED PRODUCT LINE

Ultra Carbon Corporation has announced its entry into the field of precision refractory metal structural components. This expanded line includes materials such as: silicon carbide coated graphites, pyrolytic coated graphites and numerous refractory metal carbides, borides, nitrides, silicides, and a family of powders of refractory metal compounds to specific customers' particle size distribution.

Inquiries should be directed to the company's office at Bay City, Michigan. (P.O. Box 747.)

OPTICAL SOCIETY HONORS DR. HARRISON M. RANDALL

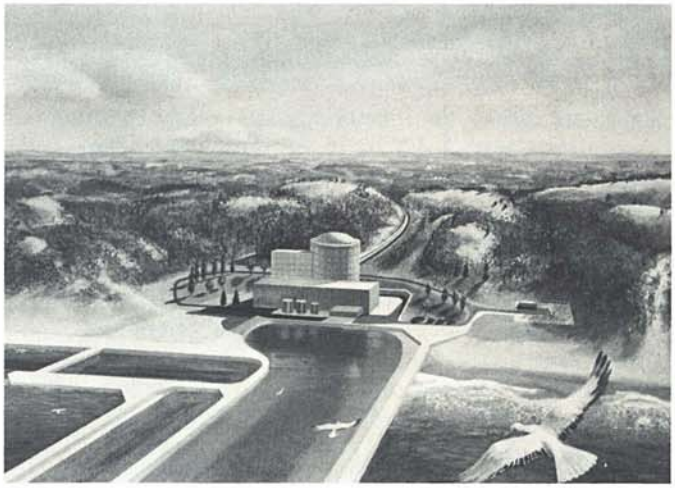
On January 19, 1967, Dr. Harrison McAllister Randall was named an Honorary Member of the Optical Society of America. The honor was bestowed upon him during a symposium, "Optical Frontiers" sponsored by the newly formed Ann Arbor section of OSA. Ceremonies took place at the University of Michigan. (Dr. Randall was featured as Spectroscopist of the Month in the January, 1967, issue of *Arcs and Sparks.*)

Those attending the presentation ceremonies included (front row) Mrs. John Randall (daughter-in-law of Dr. Randall): Dean Sawyer, retired professor at the University of Michigan; Dr. Randall; Mary Henry, Ultra Carbon Corporation; Dean Kraus, retired professor at the University of Michigan; and Arthur Ingalls, President of the Ann Arbor section of OSA. Back row: D. J. Lovell, University of Michigan; Robert Smith, AC Spark Plug Division, General Motors Corporation; Mrs. Esther Miller (daughter of Dr. Randall); D. L. Fry, General Motors Research; and John Sanderson, President of OSA.

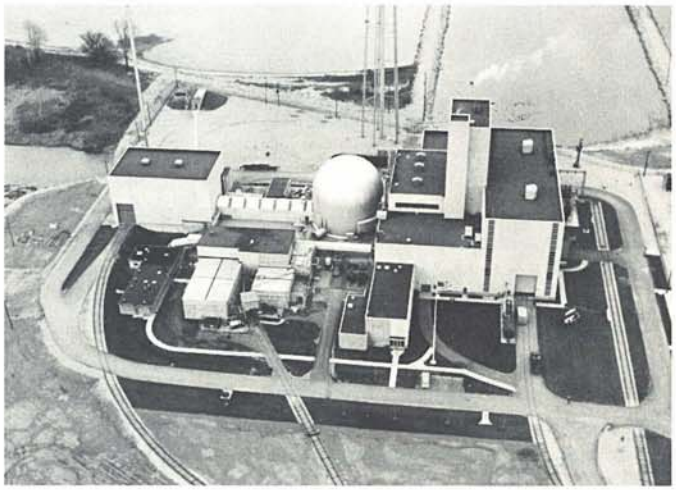
DR. GERALD M. RASSWEILLER (shown above with his son George) one of General Motors' leading scientists and research administrators, has announced his retirement from the General Motors Research Laboratories, Warren, Michigan. Dr. Rassweiler joined the laboratories in 1928 and has made many significant contributions in automotive research. He was instrumental in pioneering a study which lead to the development of the high compression engine. He introduced the electron microscope into the laboratory as a tool for metallurgical research.

At the time of his retirement he held the post of technical director of basic and applied sciences for GM research. He is a fellow of the American Physical Society and a member of the Optical Society of America, Sigma Xi honorary science fraternity, the Society of Applied Spectroscopy and the Society of Automotive Engineers.

Consumers Power Company's Big Rock Point Nuclear Power Plant near Charlevoix has been in operation since 1962, first as a research and development facility and later as a power producer. The plant's boiling water reactor and turbogenerator unit are rated at 75,000 kw.



Consumers Power Company's proposed Palisades Nuclear Power Plant as it will look upon completion, scheduled for early 1970. It will contain a pressurized water reactor. The plant will have at least 710,000 kilowatts capacity of power for the Company's statewide system in Michigan.



The Enrico Fermi Atomic Power Plant near Monroe, Michigan, where The Detroit Edison Company studies of the breeder concept are being made in cooperation with a variety of American industries. Consumers Power Company was an early participant in the Fermi project.

HOMETOWN REPORT

MICHIGAN UTILITY COMPANY ACTIVE IN NUCLEAR POWER DEVELOPMENT

The utility company which supplies electricity and natural gas to the Ultra Carbon Corporation at Bay City is Consumers Power Company, one of the investor-owned electric industry's pioneer participants in nuclear power programs.

The Company, which has its headquarters at Jackson, provides electric service in 61 of Michigan's 68 Lower Peninsula counties, outside of Detroit proper. Gas service is provided in 37 Lower Peninsula counties.

In the late 1940s and early 1950s, Consumers Power's interest in harnessing atomic energy to electric power production was evidenced in its participation in a number of research and study projects in which various companies were active.

In 1952, when President Eisenhower signed the necessary act, the companies were free to put the atom to work as civilian users of nuclear fuels.

The first major project in which Consumers Power engaged was the Enrico Fermi Research and Developmental Power Reactor Program at The Detroit Edison Company's Monroe, Michigan, Fermi Plant.

The company is still a cooperating partner in this venture, in which studies are being made using "breeder" fuels in a power reactor. The Fermi program, now 10 years old, has, according to industry experts, yielded volumes of valuable information to participating companies concerning the breeder concept. It is this concept which, it is expected, will eventually find practical application in power production, because the breeder produces more nuclear fuel than it consumes in the process of providing heat for power.

Consumers Power Company's most dramatic success in the nuclear field to date has been its wholly-owned Big Rock Point Nuclear Power Plant at Charlevoix, on the Lake Michigan shore near Little Traverse Bay.

Here, the Company's nuclear plant regularly sends hundreds of thousands of kilowatt-hours of power into the homes, schools, stores and industries of its Outstate Michigan service area.

Big Rock Point was the world's first high power density boiling water reactor to go into commercial use. It has made significant contributions to the technology of the commercial boiling water reactor, and has been visited by scientists and engineers from all over the world. Study programs at Big Rock Point, in cooperation with the General Electric Company and the United States Atomic Energy Commission are regular occurrences. The most recent advancement in technology at Big Rock is the irradiation of cobalt made possible by the high neutron density in this reactor.

Big Rock Point was constructed 1960-62.

In addition to technically interested visitors, it has also attracted more than 430,000 visitors from among the general public.

(Continued on page 15)

Dr. Harold Ohlgren Appointed Consultant At Ultra Carbon

Dr. Harold Ohlgren has joined the technical staff of Ultra Carbon Corporation, Bay City, Michigan, and will serve as technical consultant.

A former professor of chemical engineering at the University of Michigan, Dr. Ohlgren is a registered professional engineer, providing consultant services for aerospace products, chemical processes and nuclear engineering. He has assisted several firms in long range planning of process research; development and engineering of production facilities; research and development programs for new and advanced materials; and, in the field of space and space travel, engineering assistance in cryogenic problems.

Dr. Ohlgren has a distinguished career in the field of scientific research. His positions and associations include: executive vice president in charge of operations, Nerglho, Inc.; director and vice president, Nuclear Technical Service Corporation, Ann Arbor, Michigan; director of Engineering Science Division, American Metal Products, Ann Arbor; assistant director, Engineering Research Institute, University of Michigan; assistant general manager and chief engineer, Atomic Energy Division, American Cyanamid Company, Idaho Falls, Idaho; and chief, Chemical Processing Branch, Idaho Operations office, United States Atomic Energy Commission.

While at the University of Michigan, Dr. Ohlgren was involved in the basic layouts and planning of a number of buildings on the North Campus of the University, including the Phoenix Memorial Building laboratories, hot cells and the swimming pool reactor.

In the early part of his career, Dr. Ohlgren directed programs from the basic layout stage to personnel training for approximately 60 different types of laboratory facilities, including basic research laboratories, pilot plants, production demonstration plants, quality control laboratories, test and evaluation laboratories and destructive and nondestructive test facilities.

Many of his later activities dealt with laboratories for research and analytics in the field of nuclear technologies. Involved were laboratories and pilot plants functioning in the recovery of nuclear fuels from irradiated fuel elements, preparation of special radio isotopes, and laboratories for studying the radiation effects on matter.

His more recent work has included the development of concepts and reduction to design of numerous new products and structures of carbons, graphites, metal carbides, borides, silicides, nitrides, oxides and combinations thereof.

Dr. Ohlgren is listed in *American Men of Science; Chemical Who's Who; Who's Who in the Midwest; Who's Who in the World;* and, *Who's Who in Commerce and Industry.*

He has had many articles and papers published in scientific journals and holds numerous patents and patents pending. He is a member of the National Society of Professional Engineers; Michigan Society of Professional Engineers; American Institute of Chemical Engineers; American Society of Mechanical Engineers; American Chemical Society; and, American Nuclear Society.

A native of Cokato, Minnesota, he earned his BS, BA and DSc degrees at Macalester College, and the University of Minnesota. He also studied at the University of Utah and the University of Michigan.

HOMETOWN REPORT / Continued

A new Consumers Power nuclear project is now under way, with a license to operate the plant having been applied for. This is the proposed Palisades Nuclear Power Plant, which the Company plans to build on the Lake Michigan shore near South Haven, 264 miles south of the Big Rock Point Plant. The Palisades project, with an initial electric generating capacity of at least 710,000 kilowatts, will use a pressurized water nuclear reactor. Target date for completion of this project is early 1970.

With nuclear activities among its many scientific and technical interests, Consumers Power Company expects that it will keep well abreast of developments in America's scientific community in its efforts to produce energy at the lowest possible prices, benefitting its more than 975,000 electric customers.

By the time the Palisades Plant reaches scheduled completion, the Company's total electric generating capacity will exceed 4,000,000 kilowatts.

Now he doesn't "mike" his own!

He's a valued customer of ours, today—but at one time he turned and *miked* his own electrodes. He hadn't been able to find a source where they would hold tolerances to his specifications. At one of the symposia he visited our booth. On display we had both *stocked* and *custom* electrodes. He was impressed and gave us a trial order. Since then he hasn't *made* or *miked* his own. (Fact is, we now stock several of his custom shapes so orders can be filled with a minimum of delay. Typical Ultra service.)

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