

# ARCS and SPARKS



# Season's Greetings

# Arclets and Sparklets ... from

ULTRA  
CARBON

\* With the close of the fall exhibit season we wish to express our appreciation to all of you who have worked so arduously in planning and executing the highly successful meetings during 1964. To those who have attended the meetings, we also offer our thanks for having made the effort to be there and by thus doing, show a real interest in the future of Applied Spectroscopy.

Ultra Carbon has either exhibited at or actively attended during 1964, the following meetings: The Southeastern Meeting in Gainesville, Florida, in January; The Pittsburgh Conference in March; The Mid-American Conference in Chicago in June; The Denver Conference in August; The 3rd National SAS Meeting in Cleveland in September; also during September, The Canadian Spectroscopy Symposium in Ottawa; The Gatlinburg Meeting down in Tennessee early in October; The Pacific Coast Conference in San Francisco in October; The Anachem Conference in Detroit which ran concurrently with the Pacific meeting in October; and finally the Eastern Analytical held in New York in November.

To all who have participated in any way we offer our congratulations. We know of the tremendous effort that was put into these various meetings and we feel that all who have helped have contributed to a most successful meeting year in 1964.

As I put my traveling shoes aside until the Gainesville meeting, January 21 and 22, 1965, I eagerly look forward to another opportunity to see all of you personally.

Thanks very much.

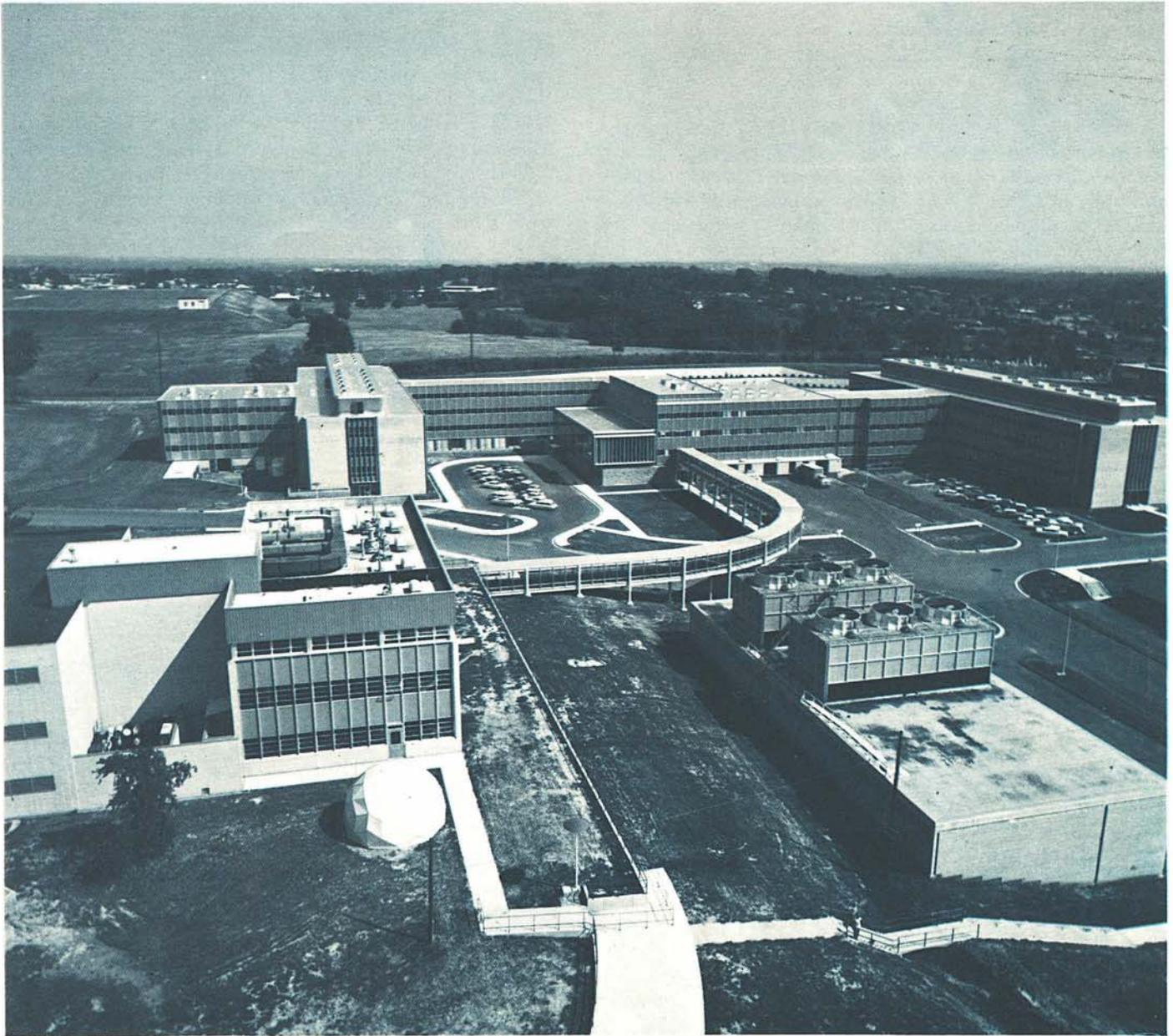
\* For those doing crucible fusion sample preparation, Ultra Carbon Corporation provides something for the X-Ray Spectroscopist — Crucible No. A-2627 and also a most convenient Crucible Carrier, B-3043. The crucibles are 2" in diameter and 1½" high and have a volume of 33.27 cc. The Crucible Carrier holds ten crucibles for ease in loading and handling into and out of a large muffle furnace.

An excellent description of the method developed by Welday, Baird, McIntyre and Madlem of Pomona College, Claremont, California, was presented in the American Minerologist, Vol. 49, July-August, 1964.

\* We invite plasma jet enthusiasts to try Ultra's graphite control rings to be used with the commercially available plasma jet assemblies. Electrode No. 7291 is the upper control ring. And 7292 is the lower anode ring. They'll help you get good analytical results.

# *LABORA-STORY OF THE MONTH*

## **MONSANTO COMPANY Physical Science Center St. Louis, Missouri**



Overall view of the Monsanto Company Research Center in suburban St. Louis. Laboratory connects through pedestrian bridge and tunnel system to General Offices of the company.

The Research Center of Monsanto Company was established in 1961 in the rolling countryside of St. Louis County, the suburban area which partially surrounds the City of St. Louis, Missouri.

Already on the site adjoining the company's General Offices were the laboratories of the Agricultural Division and Inorganic Chemicals Division. A new structure provided facilities for the Central Research Department and for representative groups from most of the company's operating divisions.

Altogether, about a third of Monsanto's research effort in the United States has been centralized here. Total employment at the Research Center is about 600. At the same time, the company continues to operate research laboratories at 11 other locations, from Seattle, Washington, to Pensacola, Florida. These are all research locations, distinct from plant laboratories primarily concerned with plant problems and quality control work.

Monsanto, which began operations in 1901 with a single product, saccharin, is a broadly diversified corporation today with a large stake in man-made fibers, organic and inorganic chemicals, plastics and agricultural chemicals. The company is basic in phosphates, from ores in the ground to detergents and food additives, and in hydrocarbon materials, from oil and gas wells through monomers to polymers.

The Central Research Department acts as landlord for the Research Center, and has assembled analytical instrumentation in a Physical Sciences Center presided over by Dr. William E. Koerner. A broad range of analytical instruments is to be found throughout the several laboratory wings and buildings of the Center, ac-

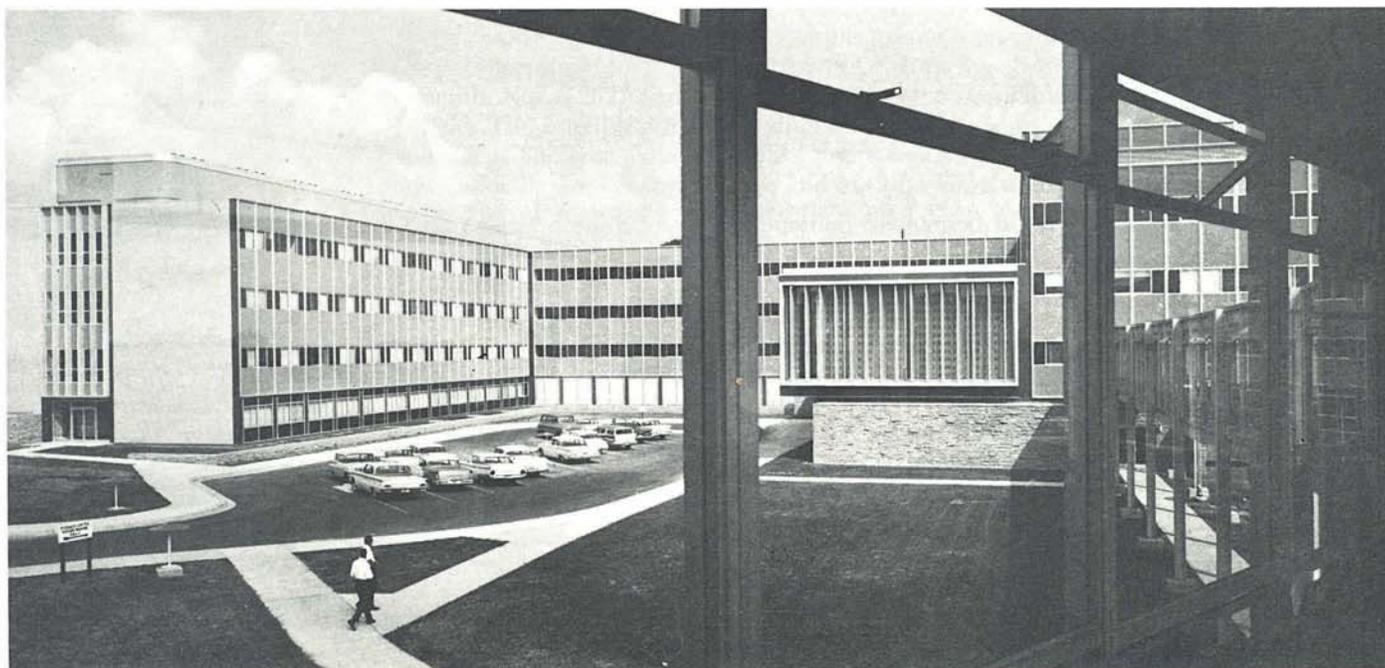
ording to the projects under attack at the various locations, but the major instruments are under the supervision of Dr. Koerner and his associates.

A most unusual feature of the Physical Sciences Center is that all instrumentation is on an open access basis twenty-four hours a day. The Center's library is operated in the same manner, in the belief that if an individual cannot be trusted with the books and instruments, he can hardly be trusted to do independent scientific research.

The staff of the Physical Sciences Center has developed training courses for the hardware, and has produced abbreviated operating instructions mounted on flip charts to serve as reminders for chemists performing their own analyses.

The electromagnetic spectrum is well covered with the instruments available to Monsanto research personnel. Beckman IR-4 units use the spread from 1 to 16 microns (NaCl) or 10 to 24 microns (KBr). A Perkin-Elmer Model 221 spans 2.5 to 20 microns, while Beckman IR-5 and IR-5A units are also available on the site. A Cary Model 14 recording spectrophotometer covers the band from 0.6 to 2.6 microns. Raman spectroscopy is also at hand with a Carey Model 81 spectrometer.

In the visible and ultra-violet region, a Jarrell-Ash 3.4 Ebert spectrograph provides coverage with a grating carrying 15,000 lines to the inch or with a grating carrying 30,000 lines to the inch. A Varisource, photoprocessor and microphotometer are supporting instruments. Also in the visible spectrum, a Perkin-Elmer 214 atomic absorption spectrophotometer provides quick analyses of samples which lend themselves to this treatment.



Main buildings of Monsanto Company Research Center. Library is in central part of the complex, architecturally separated from the rest of the design.

Flame, fluorescence and ultra-violet techniques are also employed in the Physical Sciences Center. A Norelco x-ray vacuum spectrometer and a General Electric XRD-5 x-ray diffractometer cover this part of the spectrum, supplemented by a Cambridge x-ray scanning microanalyzer.

In nuclear magnetic resonance, a high resolution Varian HR-60 is employed to determine functional groups and the structure of compounds containing hydrogen, phosphorous, fluorine or boron. The qualitative and quantitative detection of unpaired electrons is accomplished with a Varian EPR 100KC spectrometer system.

In the field of mass spectrometers, the center is equipped with a spark source Consolidated Electrodynamics Corp. Model 21-110 as well as a heated inlet system CEC Model 21-103C.

Moving further into the field of physical measurements, the Monsanto Research Center is equipped with a RCA EMU-3E electron microscope, a Spinco Model E ultracentrifuge, Mechrolab Model 301 vapor pressure osmometers, and a Monsanto designed and built Brunauer-Emmett-Teller apparatus for the measurement of surface areas.

From Abraders through X-Y recorders, the miscellaneous instruments available to Monsanto research read like the pages from a compendium of analytical techniques.

Gas chromatography is a feature of the Physical Sciences Center activity. Most recently, the group has successfully operated a chromatograph in tandem with a mass spectrometer. Peaks from the chromatograph are sampled physically and introduced into the spectrometer for rapid analysis. This form of machine development and innovation is the main responsibility of the analytical staff, rather than the running of straightforward analyses.

On request, the staff will perform instrumental analyses, but because time is often the limiting factor in industrial research, the exploring chemist may find it to the advantage of his project to operate the instruments himself.

The system to date has not resulted in the destruction of a single instrument through operational errors. On a few occasions, an instrument has been monopolized by a group for a long enough period of time to justify acquisition of another instrument.

The main value of the Physical Sciences Center to the Monsanto research effort is that it brings together in an accessible spot an array of instrumentation which would outstrip the budget allocation of the research departments of any of the individual operat-

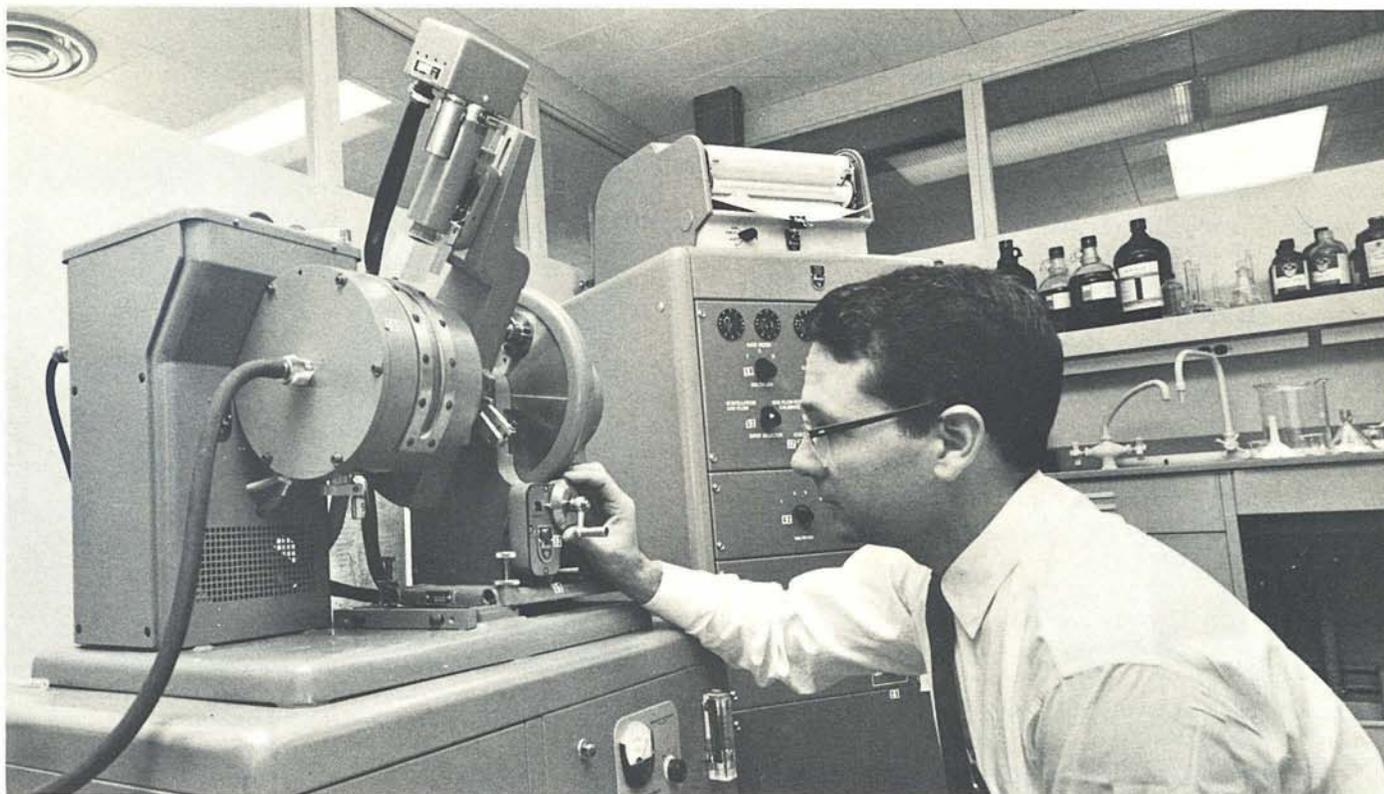


Thomas E. Reichard works with the Cambridge Mark II x-ray scanning microanalyzer.



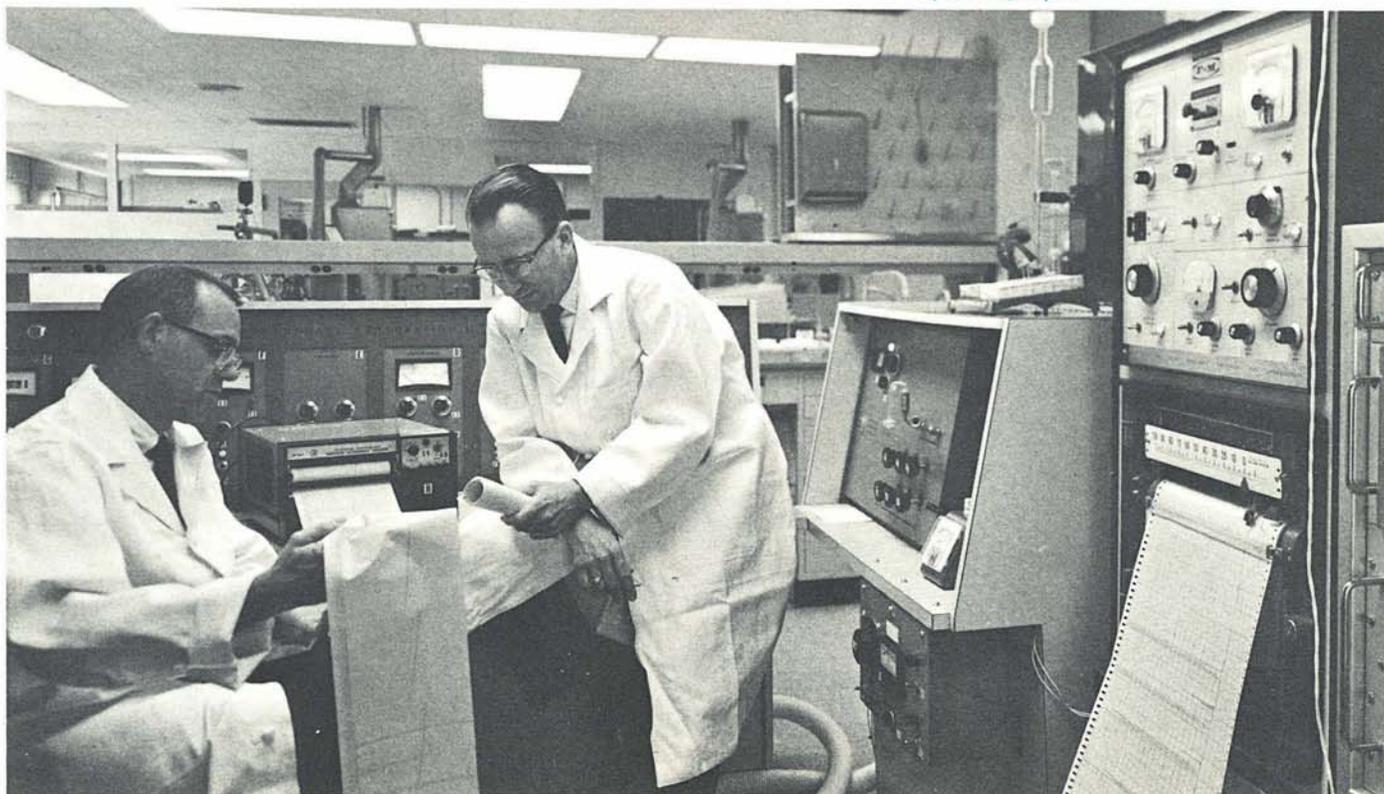
Richard A. Martin adjusts the Perkin-Elmer 214 atomic absorption spectrophotometer. Flip-chart on the console is to remind occasional operators of steps to follow.

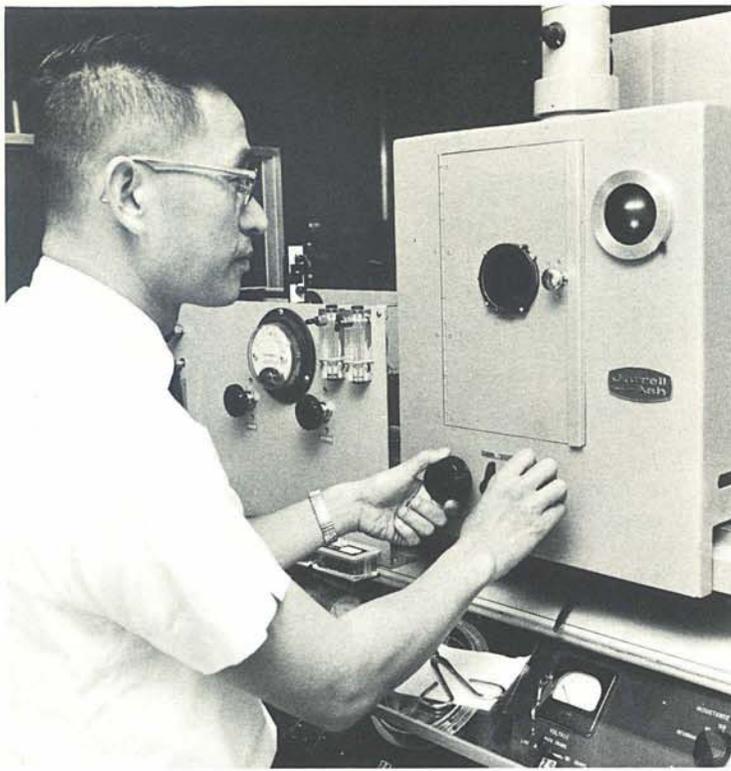
ing divisions, even though each of these is as large in its own right as many well-known chemical companies. At the same time, the analytical instrument experts are free to concentrate on the development of techniques for solution of new problems uncovered by the research program and on the extension of the powers of the machines under their control.



James L. Ogilvie positions a sample in the Philips x-ray fluorescence spectrophotometer.

O. P. Tanner, senior research engineer, and William S. Coakley of the Physical Sciences Center go over output from the gas chromatograph in right foreground which has been analyzed by the mass spectrograph.

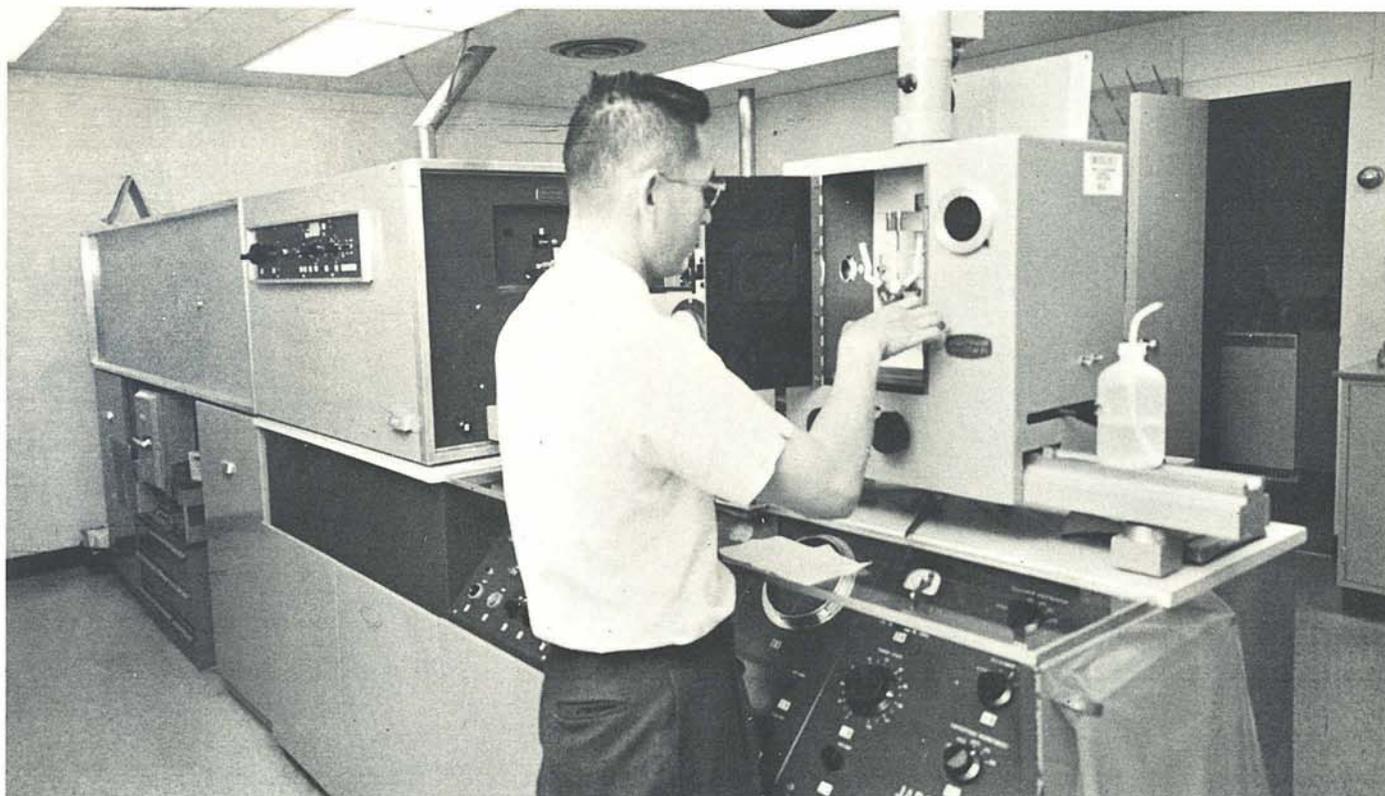




Dr. M. S. Wang positions electrodes in the Jarrell-Ash Ebert spectrograph.

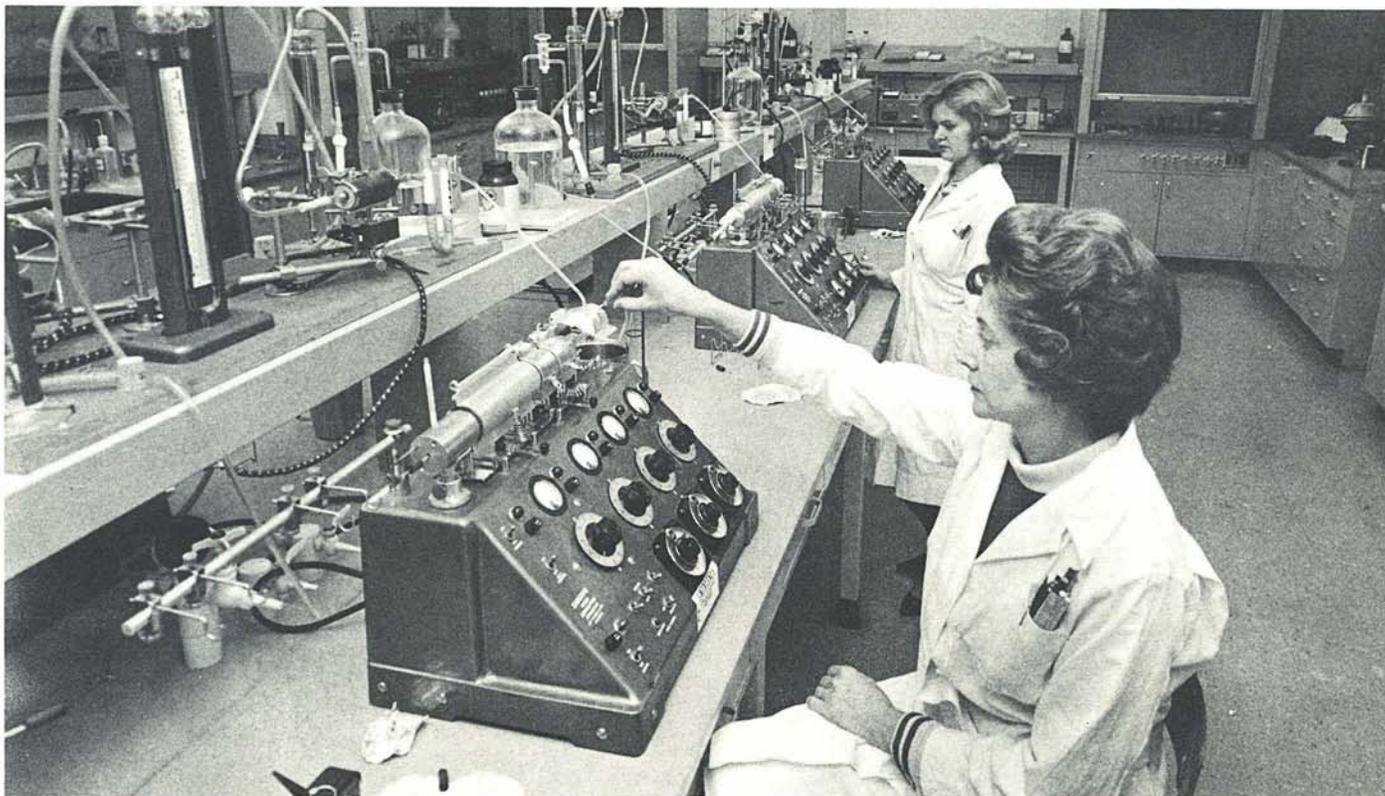
Non-instrumental analytical techniques are covered at Monsanto. This is a part of the section which occupies the floor above the instrument laboratory at the Research Center.



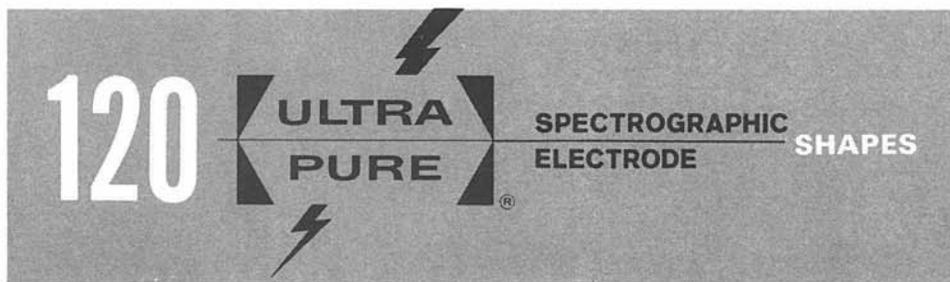


Dr. M. S. Wang is shown with the Jarrell-Ash Ebert spectrograph. Only a few of the Monsanto Company research staff have been qualified to use this instrument.

Mrs. Doris Stogsdill (foreground) and Miss Sandy Highland are shown working with Sargent micro-combustion apparatus in the micro-analytical section of the Research Center.



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# EASTERN ANALYTICAL SYMPOSIUM

## Attendance up 20%

## Dr. Fassel awarded Medal

Three thousand, three hundred and forty-four chemists met at the Statler Hilton Hotel on November 11-13 for the 1964 Eastern Analytical Symposium. The meeting was sponsored by the American Chemical Society, the Society for Applied Spectroscopy, and the American Microchemical Society. The attendance figure represents an increase of 20 per cent over the 1964 figure.

Paul Lublin of the General Telephone & Electronics Laboratories, New York, was general chairman of the meeting. Arrangements were made by Charles H. North of the National Lead Company, South Amboy, N. J.

New crime detection techniques on "Analytical Chemistry in Criminalistics" were described at a symposium. Dr. Paul Kirk of the School of Criminology of the University of California at Berkeley presented the newest analytical tools available for police work. The special enforcement problems of the U. S. Customs Service were described by Melvin Lerner of the U. S. Customs Laboratory, Baltimore. "Analytical Chemistry and Sudden Death" was the title of a report given by Dr. Henry C. Freimuth of Maryland's department of postmortem examiners.

Techniques for scanning the moon's surface from orbiting satellites were described by Dr. Ronald J. P. Lyon of the National Aeronautics and Space Administration at a session on "Instrumentation for Extraterrestrial Analysis." "Spectroscopy of the Sun from Space Vehicles" was the title of a report by Dr. Richard Tousey of the U. S. Naval Research Laboratory, Washington, D. C. Instruments that can be used to study the composition of the surface of the moon and planets were outlined by Dr. Jacob Trombka of the Jet Propulsion Laboratory, Pasadena, Calif.

"Materials Problems of the Space Industry" was the topic of a paper by Dr. E. Scala of Cornell University. Dr. James P. Lodge, Jr. of the National Center for Atmospheric Research, Boulder, Colorado, reported on "Analytical Chemistry and Air Pollution". A total of sixty-five technical papers were given.

The 13th Annual Award of the New York Section, Society for Applied Spectroscopy was presented to Dr. Velmer A. Fassel at the Eastern Analytical Symposium.

In presenting the Medal, Mr. Charles H. North, Immediate Past Chairman of the New York Section, S. A. S., cited Dr. Fassel's contributions as a scientist, educator and editor.

A native of Frohna, Missouri, Dr. Fassel graduated with honors in Chemistry from Southeast Missouri State College in 1941 and earned his Ph.D. from Iowa State College in 1947. Beginning in 1942, he organized and headed the Spectrochemistry Section of the Ames Laboratory at Iowa State. He has held the rank of Professor in the Chemistry Department since 1956.

Dr. Fassel has been the author or co-author of approximately 75 publications which have described his research in the spectral regions from x-rays to the infrared. The contributions from his laboratory have included methods for the analysis of mixtures of the rare-earth elements, lithium isotopes, and hafnium-zirconium mixtures. His studies in flame excitation and in atomic absorption spectroscopy have extended these methods of analysis to several elements which could not previously be determined in these ways. Information from his laboratory has contributed to the understanding of the structures of atoms and molecules.

Dr. Fassel is equally noted as an educator. A steady stream of students has come to his laboratory and classroom, and many have since become leaders in their own fields of spectroscopy, reflecting the training and inspiration they received from a capable and enthusiastic teacher.

In his acceptance address, entitled "The Value of Scepticism and of Being Cautious," Dr. Fassel drew on his experience as an editor of *Spectrochimica Acta* since 1953. He noted that it is the function of an editor of a scientific journal, with the help of reviewers, to insure the accuracy and clarity of the information in the scientific literature. In spite of these efforts, inaccurate information at times does get into print, and these errors may come to be accepted as being correct. An open mind about the "accepted facts," he said, can sometimes lead to a new approach to a problem that might otherwise be missed.



WHO'S SUPERSTITIOUS? Not Dr. Fassel. He made that clear in accepting the SAS, New York Section, Medal on Friday the 13th, at 2:13 p.m. in November. Dr. Fassel of Iowa State University is the 13th recipient of the award. Dr. Fassel (right) accepted the award from Charles H. North.



During the Press Conference at the Eastern Analytical Symposium . . . (left to right) William Hines, Washington Star; Malcolm Monber, Newark Evening News; Alex Gordon, Lab. World; and Dr. Paul Kirk, Criminologist at the University of California at Berkeley.



Mr. Robert J. Murphy, Metals and Controls Division, Texas Instruments Company, Attleboro, Massachusetts, and son Kevin.



National News coverage for 1964 Eastern Analytical Symposium . . . (left to right) Moderator, Alvin Bober, U. S. Customs Laboratory, Baltimore, Maryland; Dr. Marvin Margoshes, Publicity Chairman, National Bureau of Standards, Washington, D. C.; Paul Lublin, General Chairman, General Telephone and Electronics Laboratory, Bayside, New York; and Duke McGrath, United Press International News Film.



Lunchtime! Dr. Marvin Margoshes (left), National Bureau of Standards, Washington, D. C. and Dr. Isidore Adler, Goddard Space Flight Center, NASA.



Enjoying a moment to relax . . . (left to right) William R. Kennedy, American Cast Iron and Pipe Company, Birmingham, Alabama; John Norris, Jarrell-Ash Company, Waltham, Massachusetts; Dr. Mabel Wilson, Allied Chemical Corporation, Research Laboratories, Morristown, New Jersey; and "Bill" Wilson.



### 1964 Eastern Analytical Symposium Student Award Winners

Each Sponsoring Group of the Eastern Analytical Symposium annually selects up to five students of analytical chemistry or spectroscopy to be their guests at the meeting with expenses paid by the Symposium.

The purpose of this program is to encourage students to attend professional meetings, to familiarize them with the quality of information to be acquired, and to enable them to meet and talk with other scientists working in their field. The 1964 Student Award Winners are: (front row, left to right) Mr. Thomas Kashuba, Villanova Univ.; Miss Evelyn J. Eckstein, Hunter Coll.; Mr. Melvin Hill, Penna. State Univ.; Miss Patricia Redder, Fordham Univ.; Miss Lynda Wolff, Farleigh Dickinson Coll.; Miss Joan Krystock, Northeastern Univ.; Miss Fredricka Hill, St. Elizabeth Coll.; Miss Ruth Ann O'Conner, Caldwell Coll.; and Miss Carol Hoffman, Brooklyn Coll. (Second row, left to right) Mr. Stephen Starrick, Frederick Dickinson Coll.; Mr. Richard Johnson, Rutgers Univ.; Mr. Larry Morgan, Wagner Coll.; Mr. Stephen R. Heller, Georgetown Univ.; Mr. Sal Romano, Rutgers Univ.; Mr. Robert Leitch, Rutgers Univ.; Mr. Peter Haytko, Rutgers Univ.; and Mr. Barton Soloman, Univ. of New Hampshire. (Third row, left to right) Mr. Francis W. Grogan, Rensselaer Polytechnic Inst.; Mr. Al Jamison, Upsala Coll.; Mr. H. McDowell, Howard Univ.; Mr. Richard Gilardi, Univ. of Maryland; Mr. Leonard H. Smiley, Univ. of Delaware; Mr. Hans Jindal, Temple Univ.; Mr. John Chase, Drew Univ.; Mr. Albert Harvey, Tufts Univ.; and Mr. Ronald J. Koch, Johns Hopkins Univ.

### CONFERENCE COMMITTEES

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# the grapevine

RENEWING AN ACQUAINTANCESHIP . . . is one of the treats we all look forward to at meetings. In Cleveland at the 3rd SAS National Meeting it was a pleasure seeing Bill Boyer, formerly with Armco Steel Corporation, Baltimore. Bill is now doing analytical consulting work in Eastern Pennsylvania. His address is 17 Jeffrey Road, Reading, Pa. We wish him the greatest possible success.

E. S. MELICH . . . better known as "Stan" to you and his many other friends, is now teaching Chemistry at Shaker Heights High School, Shaker Heights, Ohio, and enjoying it very, very much. Stan was with Brush Beryllium Company, Elmore, Ohio, where he headed the Analytical Department. Just to keep his fingers in the industrial pie, Stan is also serving as a Quality Control Consultant. We're sure you join us in wishing him good luck and best wishes.

DR. R. A. FRIEDEL . . . is now in Australia serving as Principal Senior Research Scientist for the Commonwealth Scientific and Industrial Research Organization laboratories of the Australian government. A research fellowship granted by the Guggenheim Foundation made the trip possible. His two research functions during his one-year stay are: determination of spectroscopic band assignments in carbonaceous pyrolyzates through the use of labelling isotopes, and consultation with Australian scientists on various spectroscopic research projects.



Busy getting things in shape for The 16th Pittsburgh Conference are Bruce M. LaRue (left), Conference President; and Dr. James P. McKaveney, Vice President. The conference will be held March 1 thru 5 at the Penn-Sheraton Hotel. This Conference is certainly one of the biggest annual events for spectroscopists and the date is not too far away. We hope this is another record-breaker.

Mrs. Friedel and daughters, Patricia and Teresa, are with Dr. Friedel for the year. They plan to return in late Summer, 1965. Dr. Friedel is with the Pittsburgh Coal Research Center of the Bureau of Mines where he is Project Coordinator.

CHICAGO . . . here we come. The 16th Annual Mid-America Symposium on Spectroscopy will be June 14 thru 17 this year at the Sheraton-Chicago Hotel. The expanded program includes two-day sessions in the following major areas: emission — flame — atomic absorption, nuclear magnetic resonance, UV-VIS-IR-Raman, X-ray spectroscopy and gas chromatography. And new this year is a one-day session in gamma ray and nuclear particle spectroscopy. Final deadline for submission of titles and abstracts is February 15. Address communications to Symposium Chairman: Louis R. Pearson, American Can Company, Research Center, Barrington, Illinois.

KEEP DENVER IN MIND. The 4th National Meeting of the Society for Applied Spectroscopy, August 30 through September 3, 1965, will take place in one of the nation's most glamorous scenic and vacation areas: the Colorado Rockies.

Denver, site of the 4th National Meeting, is the capital of colorful Colorado and the gateway to a region which includes almost half of this nation's National Parks and National Monuments. Two of our National Parks — Rocky Mountain and Mesa Verde — and three of our National Monuments lie within the State of Colorado itself and are reached from Denver in a day's drive.

From the ultra-modern Denver Hilton Hotel, where all meetings and the accompanying exhibits of equipment will be centralized, participants will see three mountains towering above 14,000 feet: Pikes Peak, Mt. Evans and Longs Peak. Within a half day's drive, visitors can motor to the top of Pikes Peak, scale Mt. Evans to the highest point reached by autos in the world, or traverse the highest continuous auto road on earth. Trail Ridge Road.

Yet Denver, for all its nearness to such natural wonders, is a cosmopolitan city, offering the finest in accommodations, entertainment and cuisine — either in "come-as-you-are" Western style, or as formal as the visitor may desire. Apart from natural wonders, the Denver area also offers such attractions as the U. S. Air Force Academy near Colorado Springs, the National Bureau of Standards in nearby Boulder, and the Federal Center in Denver. Three major educational institutions with outstanding research facilities lie within a few miles of each other: Colorado School of Mines in Golden, the University of Denver, and the University of Colorado in Boulder.

# *We left our hearts at the . . .* **3rd PACIFIC MEETING**



Excellent talk . . . is probably what Fred Stross (left), Shell Development, told banquet speaker Professor Joseph D. Lohman, Dean of the School of Criminology of the University of California at Berkeley. Professor Lohman's fascinating talk was entitled, "Crime in Modern Society and its Prospects."



With the Missus . . . Mr. and Mrs. John G. Conway. Good work, John, as Co-General Chairman of the meeting.



Working up an appetite . . . (left to right) J. C. Guffy, California Research Corporation; David Burge, Melabs; Mrs. Guffy and Mrs. Anthonisen.

## *All smiles in San Francisco*

It's not surprising that they write sentimental ballads about San Francisco. It's a remarkable city.

And it's not surprising that the 3rd Pacific Meeting in San Francisco on October 21-23 at the Jack Tar Hotel was a smashing success: excellent facilities, perfect weather, delicious food, breathtaking sights, and of course, an interesting conference on spectroscopy, instrumentation and chemistry.

Attendance of 500 was expected. Over 700 registered. There were 55 exhibitor booths planned. Almost 200 exhibitors! When San Francisco calls, we certainly come running. Everyone was commenting on the well-organized meeting and are looking forward to the next one in October of 1966.

### COMMITTEE CHAIRMEN

- J. G. Conway and E. Bergman, General Chairman
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Comparing notes . . . (left to right) Willa Wadleigh, UCLRL Livermore; and Charles E. Harvey, Washington State University.



Long time no see . . . as L. W. McNeil of Lockheed Missiles and Space Corporation, Sunnyvale, California, chats with Nick Grondin, Ultra Carbon. "Mac" was with Ford Motor Company in Chicago, and is now back with an old working associate, Art Ernster.



## UN Project

As part of the United Nations Special Fund Project to assist the Geological Survey in British Guiana, a Hilger and Watts large Littrow Spectrograph has recently been installed. Mr. D. R. Curry of Mineral Resources Division, Overseas Geological Surveys, London, was seconded for a two-month assignment with the UN to set up standards and train local operators. The spectrograph will be used for the analysis of geochemical soil samples, now being taken at the rate of 10,000 per annum. While in South America, Mr. Curry took the opportunity of visiting the Geological and Mining Service in Surinae which has similar equipment.

D. R. Curry (right) demonstrates the new equipment to Senator J. Hubbard, Minister for Trade and Industry in British Guiana. (Photo courtesy Government Information Services, British Guiana.)



DR. LAWRENCE T. HALLETT . . . (center) was recipient of the 1964 Anachem Award presented at the 12th Anachem Conference in October at Wayne State University in Detroit. Speakers during the award symposium were (left to right): Dr. H. S. Nutting, The Dow Chemical Company, Midland, Michigan; J. W. Compton, Wyandotte Chemical Corporation, Wyandotte, Michigan, Anachem Award Chairman; Dr. Hallett; Dr. L. S. Birks, U. S. Naval Research Laboratory, Washington, D. C.; and Dr. W. D. Cooke, Cornell University, Ithaca, New York.

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*All of us at  
Ultra Carbon  
wish all our friends  
peace, joy and happiness  
at this Christmas Season  
and throughout the New Year*

