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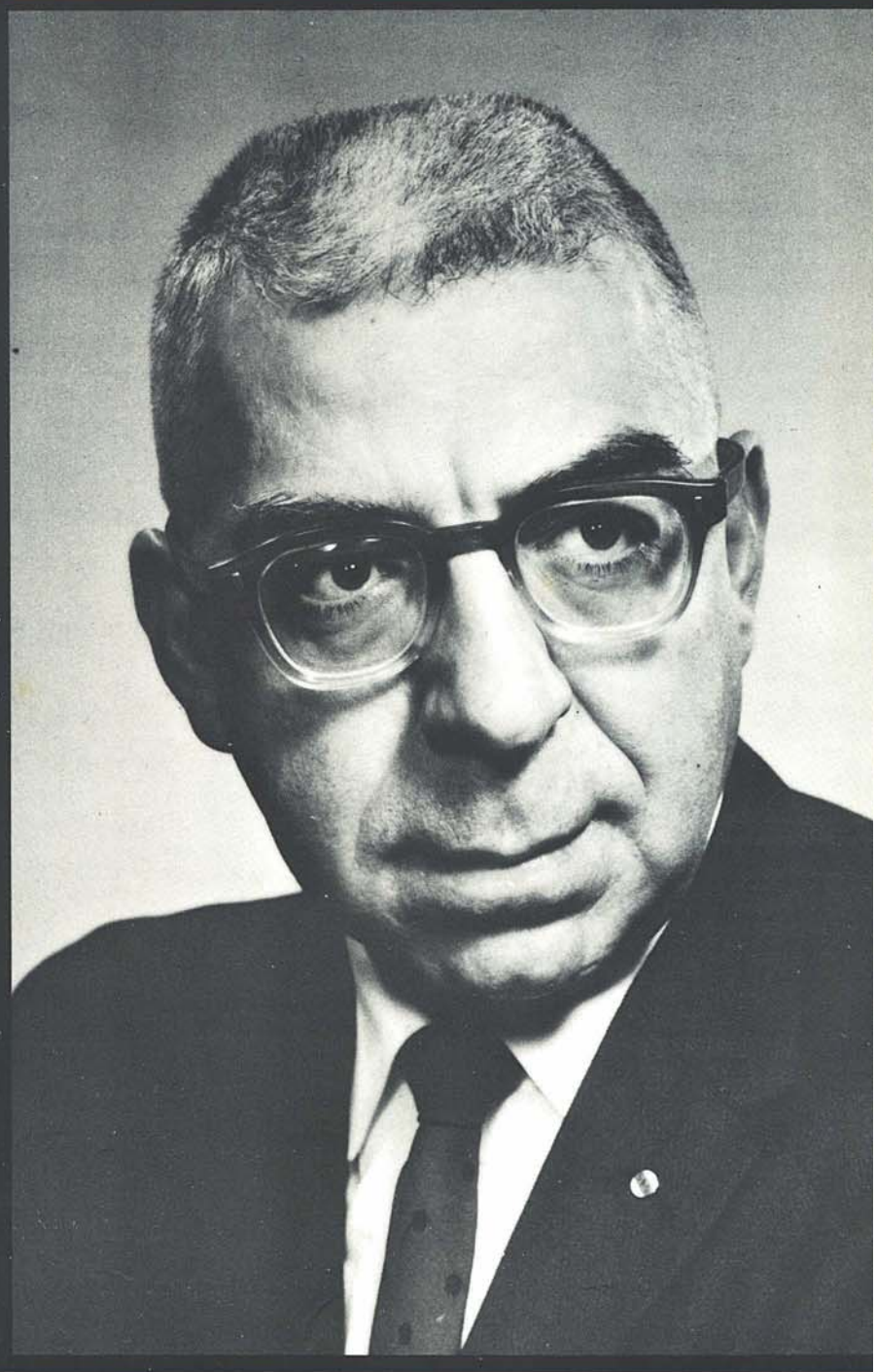
ARCS and SPARKS

JOHN R. FERRARO



Published by the Ultra Carbon Corporation . . . for the advancement of Spectroscopy

What's this issue all about?

Arcs & Sparks is published by Ultra Carbon Corporation, P. O. Box 747, Bay City, Michigan, 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

Many young spectroscopists have found that working with John Ferraro in the laboratories is not only enjoyable, but an invaluable education, too. John has a vast storage of information and countless tips, and is more than willing to share these with beginning spectroscopists. Above, he's shown with Miss Diane Kovacic observing the spectrum of an inorganic complex recorded by the Perkin-Elmer Model No. 301 Far Infrared Spectrophotometer. John is very observant, as you can see.

A salute to . . .
John R. Ferraro

This issue is dedicated to John R. Ferraro for the excellent job he has done as President of the Society for Applied Spectroscopy. It comes as no surprise that the popular Dr. Ferraro has been an able leader of our group.

There have been several worthwhile projects started and completed during John's term of office. Final affiliation with the American Institute of Physics was made. The SAS Travel Tour was established. A handbook for officers was started, as well as other brochures. Improved liaison and better communications with Local Sections was accomplished. And looking ahead, John helped to formulate objectives and establish guidelines for the future. Naturally, all these took a great deal of John's time, and he is commended for his devotion to his job.

John is currently serving his 18th year with Argonne National Laboratory, Argonne, Illinois.

A native of Chicago, he received his B.S. and Ph.D. from Illinois Institute of Technology, and his M.S. degree from Northwestern University.

He began his career at the Kankakee Arsenal in 1941 as supervising chemist for TNT and Tetryl laboratories. However, this career conflicted with his duty to his country, and in 1942 he began a four-year hitch in the Army Air Force. He was a meteorologist in the service, achieving a rank of Major. In 1948 he joined Argonne. His interests in the field of spectroscopy include Infrared, Raman, NMR of inorganic and coordination compounds and he has had papers accepted in these areas by over 75 publications. He served as co-editor of *Developments* of *Applied Spectroscopy*, Vol. 2, 1962.

In addition to SAS, John is affiliated with the American Chemical Society, the Coblentz Society, RESA and Phi Lambda Upsilon.

His SAS activities have included General Symposium Coordinator for the 13th Mid America Spectroscopy Symposium in 1962; Director of SAS Seminars from 1961 to 1965; in addition to his position as President, which was preceded by one year as President-Elect.

John has also served for seven years as a staff member of the Canisius College Infrared Institute, Buffalo, New York.

John and Mrs. Ferraro have three children, Larry, 16; Janice, 13; and Vicki, 7.

John enjoys bowling, and swings into gardening when the frost leaves the ground.

JOHN FERRARO — it's been a great year for SAS under your direction and the entire membership joins in saying, "thanks."

at the 17th PITTSBURGH Conference

The 17th Pittsburgh Conference on analytical chemistry and applied spectroscopy was held February 21 through 25, 1966, at the Penn-Sheraton Hotel. Under the direction of James P. McKaveney, the conference was well organized and enthusiastically accepted. Hats off to the Board of Directors, all the committee participants and members of the Spectroscopy Society of Pittsburgh and the Analytical Chemistry Group of Pittsburgh.

Olivia Pfaff of American Society for Testing Materials, going over some of the ASTM publications with Russell Walker of Anderson, Clayton and Company, Sherman, Texas.

The pleasure of his company are two ladies from American Cyanamid Co., Stamford, Conn., Ruth Fiala (left) and Marina Yao. Of course, he's Carl Leistner of Ultra Carbon.

R. A. Murie (left), Allison Division, General Motors Corporation; and Ramon Barnes, University of Illinois.

Joseph Weber, Jr. (left), Reynolds Metals, Richmond, Va.; Ray Baney (center), Ultra Carbon; and Leslie Achs, Canadian Copper Refiners.

The charming lady getting all the attention is Mrs. William T. Tiffin. Prof. Tiffin, of the University of Florida, smiling through it all, managed to get his head in the picture (over her left shoulder). Bourdon Scribner (left), R. E. Michaelis, both of National Bureau of Standards; and Prof. V. A. Fassel (far right), Iowa State University, are enjoying it all.

What could be better than one Fateley? Two Fateleys . . . Nolan and son Bill of Mellon Institute.

Harold C. Dilworth (left), Armco Steel, Middletown, Ohio; and Bourdon F. Scribner, National Bureau of Standards.

Left to right: John Ferris, Bausch and Lomb Optical Co.; Carl Leistner, Ultra Carbon; David Richardson, also Bausch and Lomb; and William Poehlman, A. O. Smith Co.

Sarah Degenkolb and Charles Belle, both of American Steel and Wire Division, U.S. Steel Corporation.

Paul Leichtle (left), Chase Brass and Copper Company; and Al Di Leonardi, Kennecott Refining Corporation, Baltimore.

Dr. Thomas De Vries (right), Purdue University, chats with two Ultra Carbon reps, Ray Baney and Del Hughes (center).

(Continued on next page)

Richard Lord
receives top honor at Pittsburgh

Richard C. Lord (left) was presented the Pittsburgh Spectroscopy Award by William M. Hickam, Chairman of the Spectroscopy Society of Pittsburgh.

WINNERS OF PITTSBURGH SPECTROSCOPY AWARDS

1957	Dr. George R. Harrison	Massachusetts Institute of Technology
1958	Dr. Norman Wright	Dow Chemical Company
1959	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	National Research Council, Canada
1963	Dr. William F. Meggers	National Bureau of Standards
1964	Dr. Foil A. Miller	Mellon Institute
	Dr. R. A. Friedel	U.S. Bureau of Mines
1965	Mr. L. S. Birks	U.S. Naval Research Laboratory
1966	Dr. Richard C. Lord	Massachusetts Institute of Technology

Dr. Richard C. Lord, Professor of Chemistry at Massachusetts Institute of Technology, was presented the Pittsburgh Spectroscopy Award on February 24, 1966, during the Pittsburgh Conference. This is the tenth consecutive year that the Spectroscopy Society of Pittsburgh has granted such an award to a world renowned Spectroscopist.

The title of the award address by Dr. Lord was, "Recent Developments in Far-Infrared Spectroscopy."

Dr. Lord has made many outstanding contributions to the field of Infrared Spectroscopy.

In 1946, M.I.T. named him Director of its Spectroscopy Laboratory, and in 1954 Professor of Chemistry. At M.I.T. he established the first post-graduate training course in applied infrared spectroscopy, by means of which some fifteen hundred industrial and academic research scientists from all parts of the world have received training in this field. In 1948, in collaboration with Professor George R. Harrison, Dean of Science at M.I.T., and the late Professor J. R. Loofbourow, he published the well-known text, "Practical Spectroscopy." He served as editor in the field of optics for the McGraw-Hill Encyclopedia of Science and Technology and wrote many of its articles in this field.

His researches, which have been described in some 80 technical articles, have dealt with the use of spectroscopy in the solution of chemical problems. He is known for his work on the interpretation of the infrared spectra of molecules in terms of their structure and vibrational motion, for contributions to our understanding of the cohesion of molecules by means of hydrogen bonds, and for the development of experimental procedures in the infrared region of the spectrum. He and his coworkers have contributed especially to the development of methods for the study of molecules in the far infrared, a difficult part of the spectrum at the border between the optical region and that of very short radar waves.

He is a member of the American Chemical Society, a U.S. representative on the Commission of Molecular Spectroscopy of the International Union of Pure and Applied Chemistry (President of the Commission, 1961-65), Fellow of the American Academy of Arts and Sciences, Fellow of the Optical Society of America (President-elect of the Society 1963-64; President, 1964-65), and member of various other scientific societies.

Dr. and Mrs. Lord have four daughters and reside in Milton, Massachusetts.

THE HISTORY OF SPECTROSCOPY IN THE PITTSBURGH AREA

(Reprinted from DIRECTORY, THE SPECTROSCOPIC SOCIETY OF PITTSBURGH)

Early History of Spectroscopy

The earliest spectroscopy in the Pittsburgh area was probably the pioneering work of Dr. David Alter in 1854 on "Certain Physical Properties of Light, Produced by the Combustion of Different Metals in the Electric Spark, Refracted by a Prism." This work was reported before the work of Bunsen. In 1881 at the Allegheny Observatory of the University of Pittsburgh, Dr. Langley started his work on the bolometer and on the mapping of the solar spectrum. Shortly after 1900, John Brashear built at least one double glass prism spectroscope. Since 1919, the work of Dr. Keivin Burns at Allegheny Observatory on standard wavelengths of high precision and, to some extent, in spectrochemical analysis has been a basic contribution to spectroscopy. According to the Index to the Literature on Spectrochemical Analysis by Meggers and Scribner, "When K. Burns came to the National Bureau of Standards in 1913, he brought with him some of deGramont's faith in the utility of the spectrograph, and established the first general spectrochemical service in the Western hemisphere." The subsequent establishment of hundreds of laboratories in the United States and other American countries shall provide everlasting testimony to his vision and wisdom. Dr. Burns died in 1958 and this Society shall always remember him for his strong faith, gentle mien, subtle wit, and many technical contributions to pure and applied spectroscopy.

Early Conferences on Spectroscopy

The more recent era of applied spectroscopy was ushered in by Dean George R. Harrison of M.I.T. when he gave a talk on this subject on February 14, 1940 at the Physics Department of the University of Pittsburgh. On that date, in spite of a paralyzing 15 to 20 inch snowfall in Pittsburgh, his lecture was attended by about 150 people. This prompted interest in another meeting. On June 8, 1940 a session of three invited papers was held in Thaw Hall, University of Pittsburgh, and was attended by 35 people. The invited papers dealt with the work of their respective laboratories and were given by H. V. Churchill of Alcoa, E. B. Aschraft of Westinghouse, and J. Ballard and H. Oshry of the Bureau of Mines.

This was followed during the next several years by three more conferences at the University of Pittsburgh and five more at the Mellon Institute Auditorium. The attendance kept increasing, especially after the discontinuance of the M.I.T. conferences on spectroscopy. The Pittsburgh meetings were sponsored first by the Spectroscopy Laboratory of the Physics Department of the University and later jointly with the SSP. In 1943, a one-day session of spectroscopy papers was held jointly with the OSA meeting in Pittsburgh. The first several meetings covered primarily only emission spectroscopy. These covered such topics as sources of excitation, the use of the spectroscope in metallurgy (jointly with Metallurgy Department of University), standard methods of analysis (jointly with ASTM Committee E-2) and direct intensity measurements with photomultiplier tubes. In 1945, the first paper on absorption spectroscopy was presented. Now, the conference programs cover, in addition to atomic and molecular spectra, x-ray and mass spectroscopy, flame photometry, and nuclear magnetic resonance, as requested by the participants.

Joint Pittsburgh Conferences

Since 1950, the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy has been sponsored annually and jointly by the Spectroscopy Society of Pittsburgh and the Society for Analytical Chemists of Pittsburgh, a group of the Pittsburgh Section of the American Chemical Society. It includes an extensive new instrument exhibit sponsored chiefly by manufacturers and suppliers of spectrographic and chemical equipment. The program has increased from a one or two-day meeting to a five-day meeting. Over 250 papers are presented each year and the attendance now exceeds 4000. Since 1946, abstracts of the papers have been published.

Highlights of some of the past conferences outside of the scheduled papers and talks, might include the army-style steak luncheon in the Army Mess Hall in the subterranean passages of the Cathedral of Learning in 1945. It might be Dr. Megger's hilarious "Diary" of his Pittsburgh school days at Carnegie Tech; or perhaps, the "dormitory life" in 1946 when there was a hotel strike in Pittsburgh during the Conference. Reunions of certain regular attendees have become traditional. History is still being made.

Spectroscopy Society of Pittsburgh

The Spectroscopy Society of Pittsburgh was organized in 1946 with 69 charter members. Interest in this field at that time was very high and lively, as indicated by the early issues of SPECKS, under the editorship of John McGovern, Duane Harmon, and the late Joe Lieblich.

The story of the conference certainly influences the history of the SSP, since this annual meeting has become international in scope and probably the largest single activity of the Society. However, excellent monthly meetings with both local and out-of-town speakers are held September through May, inclusive. They cover alternately emission and absorption programs. The Chairman of the SSP is alternately an emission and then an absorption spectroscopist. The two groups work well together. Most meetings are attended by representatives of both interests.

National Affiliation

In 1954, representatives of the Spectroscopy Society of Pittsburgh, joined with other representatives of a number of regional spectroscopic societies to promote a stronger relationship between these societies for the purpose of exchanging information and speakers. One recommendation that was implemented was the formation of the Federation of Spectroscopic Societies, which was formed in March, 1956, at Pittsburgh. Further development of this Federation was the formation of the Society for Applied Spectroscopy in November, 1958, at New York. On November 7, 1960, this Society was incorporated in the State of Pennsylvania as a scientific non-profit organization. In March, 1965, this Society was accepted as an Affiliate Member of the American Institute of Physics. Many members of the Spectroscopy Society of Pittsburgh have held prominent positions in the Society for Applied Spectroscopy. Edwin S. Hodge was the first Treasurer of the Society in 1959-1961 and Treasurer of the journal, "Applied Spectroscopy," in 1962. Neil E. Gordon, Jr. was President of the Society in 1962. In 1964 James E. Paterson was appointed Editor-in-Chief of the journal, "Applied Spectroscopy." Jack Hurwitz is the present Secretary of the Society.

Recent Services of SSP

In 1957, SSP established a Pittsburgh Award in Spectroscopy to be given annually to a person who has made an outstanding contribution to this field. The Society annually gives one to three awards for outstanding exhibits in this field at the annual High School Science Fair at the Buhl Planetarium. Films on emission spectrochemical analysis and infrared spectroscopy have been purchased and made available to schools and technical organizations. It has also made cash contributions to the Book Fund of the Technology Section of Carnegie Library as well as to some smaller Pittsburgh area colleges working in spectroscopy. In cooperation with other industrial and technical groups, the Society is supporting the Automation Course at Allegheny High School to stimulate scientific interest in the high schools. Contributions of money, equipment, and lecturers have been made. Since 1957, grants have been awarded to several district colleges for needed experimental equipment. In 1959, the Society pledged a $2500 contribution to the American Chemical Society Building Fund in recognition of the many years of excellent relations and cooperation between the two groups.

With such a large number of research and control spectroscopy laboratories in the Pittsburgh District, and with the large international interest in the Conference, the SSP should continue to grow and to serve spectroscopists. Spectroscopy in the Pittsburgh area appears to have become international in scope and is still growing.

ARCS and SPARKS

is proud to present this brief history of

Professor Heinrich Kaiser

and his contributions to the field of spectroscopy

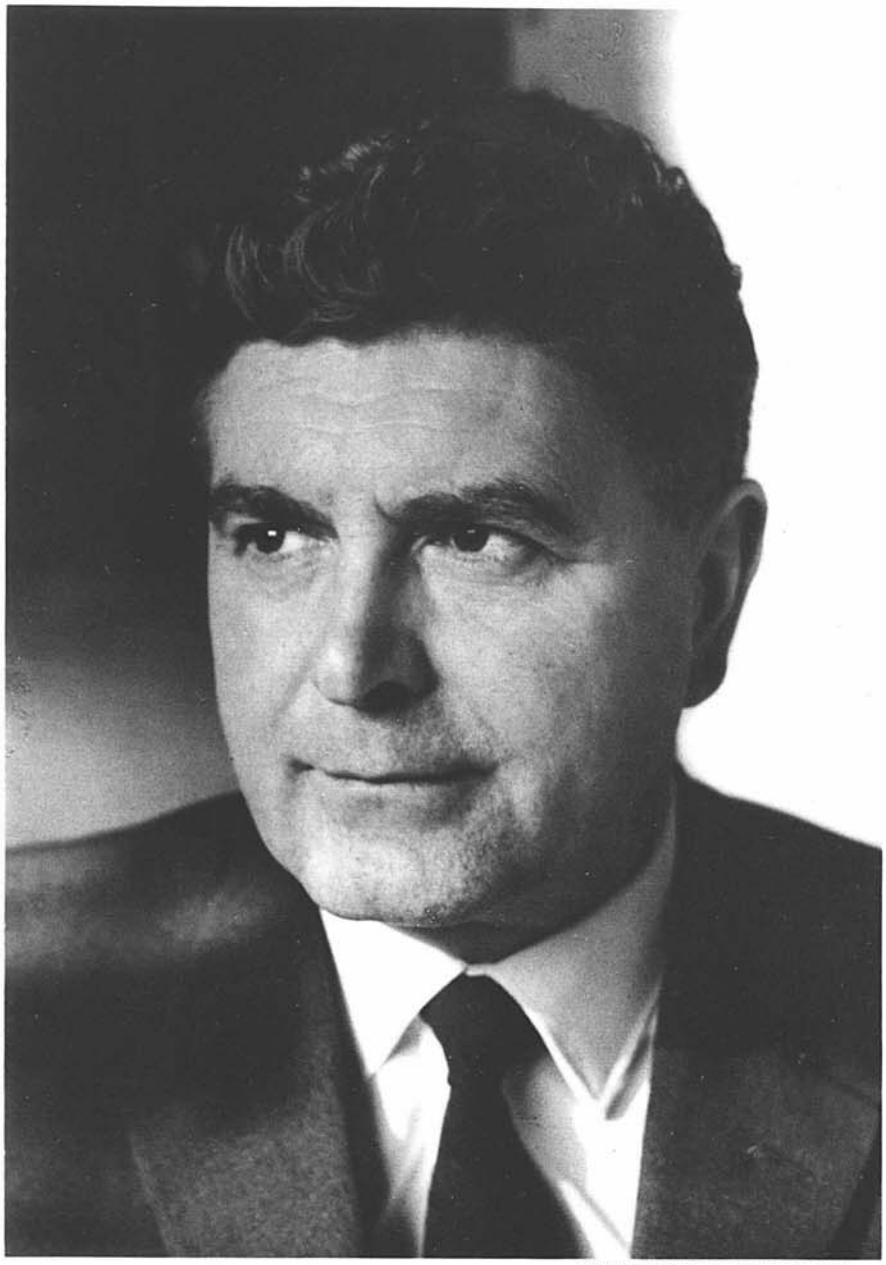


Photo courtesy Annellese Kretschmer

DR. KAISER

Professor Heinrich Kaiser was born February 5, 1907, in the industrial city of Bochum, centering in the Ruhr area, but spent most of his youth in the nearby city of Dortmund.

Forty years later the hand of fate brought him back to Dortmund, which now houses the renowned Institut fur Spektrochemie und Angewandte Spektroskopie, where he is Director.

At the Universities of Munster, Freeburg, and Cologne, Dr. Kaiser studied physics, mathematics and chemistry. The University of Cologne granted him a Ph.D. in 1932. Following graduation, he became an assistant to Professor Karl Forsterling, an authority on optics and the propagation of electromagnetic waves in the ionosphere. It was at this time that Dr. Kaiser was introduced to spectroscopy for the first time. But of equal importance, he was now actively engaged in optics research, specifically the optical properties of metals.

Under the direction of Professor Rukop, his thesis research began, which was concerned with oscillation frequencies in undamped electrical circuits. Not realizing it at the time, the insight gained in this study played a dominant role in Dr. Kaiser's later incisive studies on the properties and mechanisms of excitation in spark generators for analytical emission spectroscopy. Thus, another important segment of Dr. Kaiser's scientific background was developing.

He joined the famous optical company of Zeiss at Jena in 1934, where he remained for 12 years. In 1935, Dr. G. Hansen, head of Zeiss physics laboratory, asked Dr. Kaiser to continue an investigation on the optical emission spectrographic analysis of lead alloys, while he (Hansen) took a holiday. This was the beginning of Dr. Kaiser's illustrious career in this field. One of the by-products of this investigation was his paper (Z. tech. Physik 17, 227, 1936) entitled, "The Accuracy of Quantitative Spectral Analysis." For the first time, it was realized that high precision could be achieved in optical emission spectrographic analysis.

At this time, Dr. Kaiser's Ph.D. thesis research stimulated his thinking on the importance of a better understanding of the mechanism of spark excitation; hence he made a thorough and systematic study of spark generators and discharges. The result of this was the classical paper, "The Electrical Spark and Its Application for the Excitation of Spectra," by Kaiser and Wallroff, Annalen der Physik 34, 297 (1939).

Dr. Kaiser had other diversions during the years between 1932 and 1939. In 1934 he married Ada Thelen, whom he had met while attending the University of Cologne. He has four children, two boys and two girls. The period from 1939 to 1947 were difficult ones for Kaiser and his family.

During World War II he was retained by the Zeiss firm and headed the spectrographic laboratories at Jena and Dresden. His interest in those years in the theory and methods of photographic photometry led to other basic contributions. The generalization of the Seidel transformation actually came to him while sitting among a crowd of children playing in an air raid shelter. To this day, Dr. Kaiser feels that this circumstance, through no merit of his Providence, concealed and safeguarded him during the dark years.

At the end of the war in the spring of 1945, the Kaiser family was alive and unharmed. A few days after the occupation by the U.S. Armed Forces, Dr. Kaiser was visited by Dr. W. R. Brode, and later by Dr. R. A. Sawyer, along with many other scientists from the Zeiss

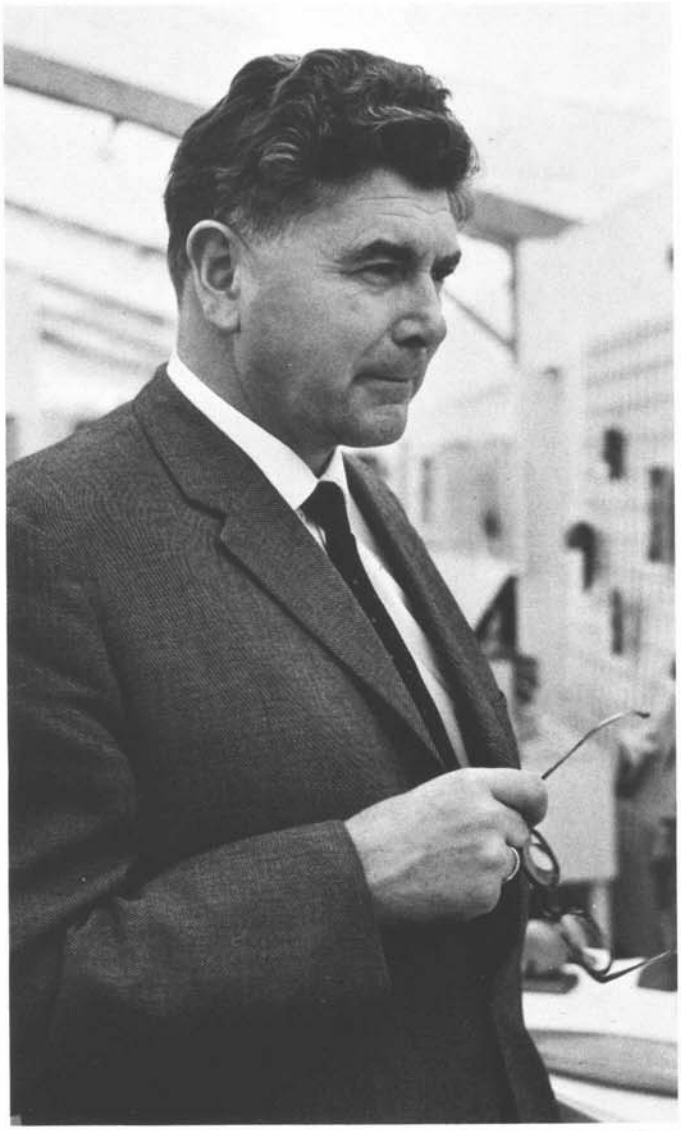
Photo courtesy of A. Renger-Patzsch

Here is Dr. Kaiser with his professorial garb and look. Hundreds of students have profited from his stimulating lectures.

works. Dr. Kaiser and his family were moved by the U.S. Army to Southwest Germany. Some good fortune came his way when he was able to procure a truck to transport his family and library. His wife, Ada, naturally, would have preferred to have taken more household articles than books for the hard years yet to come. Although the future was unknown, a new life full of hope and expectation was again starting for him and his family. The next three years were difficult ones, indeed, but his confidence in the future did not falter.

(Continued on next page)

Dr. Kaiser's cloud with a silver lining appeared in late 1947 when he joined the newly founded State Institute for Testing Materials in Dortmund. At last he was back home, and also in a good spectrographic laboratory. At the same time he became Privat Dozent of Physics at Bonn University (where Prof. W. Gerlach chaired the Department of Physics). Several advanced students joined Dr. Kaiser's laboratory at Dortmund; one of them, Kurt Laqua, was the first to obtain a doctor's



With interests in many areas outside spectroscopy, Dr. Kaiser enlivens any conversation. Here we see him giving a curious eye to a hobby exhibition.

degree under Dr. Kaiser's direction. In 1958 Dr. Laqua became head of the emission spectroscopy group in Dr. Kaiser's Institute.

In April of 1951, Dr. Kaiser was asked by a newly founded governmental Council for Cooperation in Research to deliver a speech on the future development of spectrochemical analysis in Germany. In a discussion that followed his speech, a proposal was brought forward to establish a special research institute for the promotion of spectrochemical analysis in Western Germany. Dr. Kaiser was elected to develop a definite plan and program for such an institute. After nearly a year of negotiation with government and industry, a Society for promoting spectrochemistry was founded and this society was given the responsibility to build up and run the Institute on the premises offered by the City of Dortmund. In 1953 the new Institute was inaugurated with a staff of 20. Since that time the Institute has grown considerably; the total number of employees at the present time is 95, and about 30 of them are academically trained. In 1962 a new building was opened, 10 years after the founding of the Institute. It covers 27,000 square feet and is situated on a beautiful park-like setting. Various government sources, and some industry contributed to the financial support of the project. The Institute itself has freedom to plan its research activities, but it keeps its feet on the ground by undertaking practical work on a contract basis; it endeavors to cover all fields of analytical spectroscopy.

The Institute's main activities are: Atomic spectroscopy, X-ray fluorescence and atomic absorption, directed by Dr. K. Laqua; inorganic analytical chemistry, directed by Prof. Specker (now chairman of the Chemistry Department at the new Bochum University); mass spectrometry, directed by Dr. Aulenger; molecular spectroscopy, directed by Dr. Schroder; and electronics and general physics, directed by Dr. Hagenah.

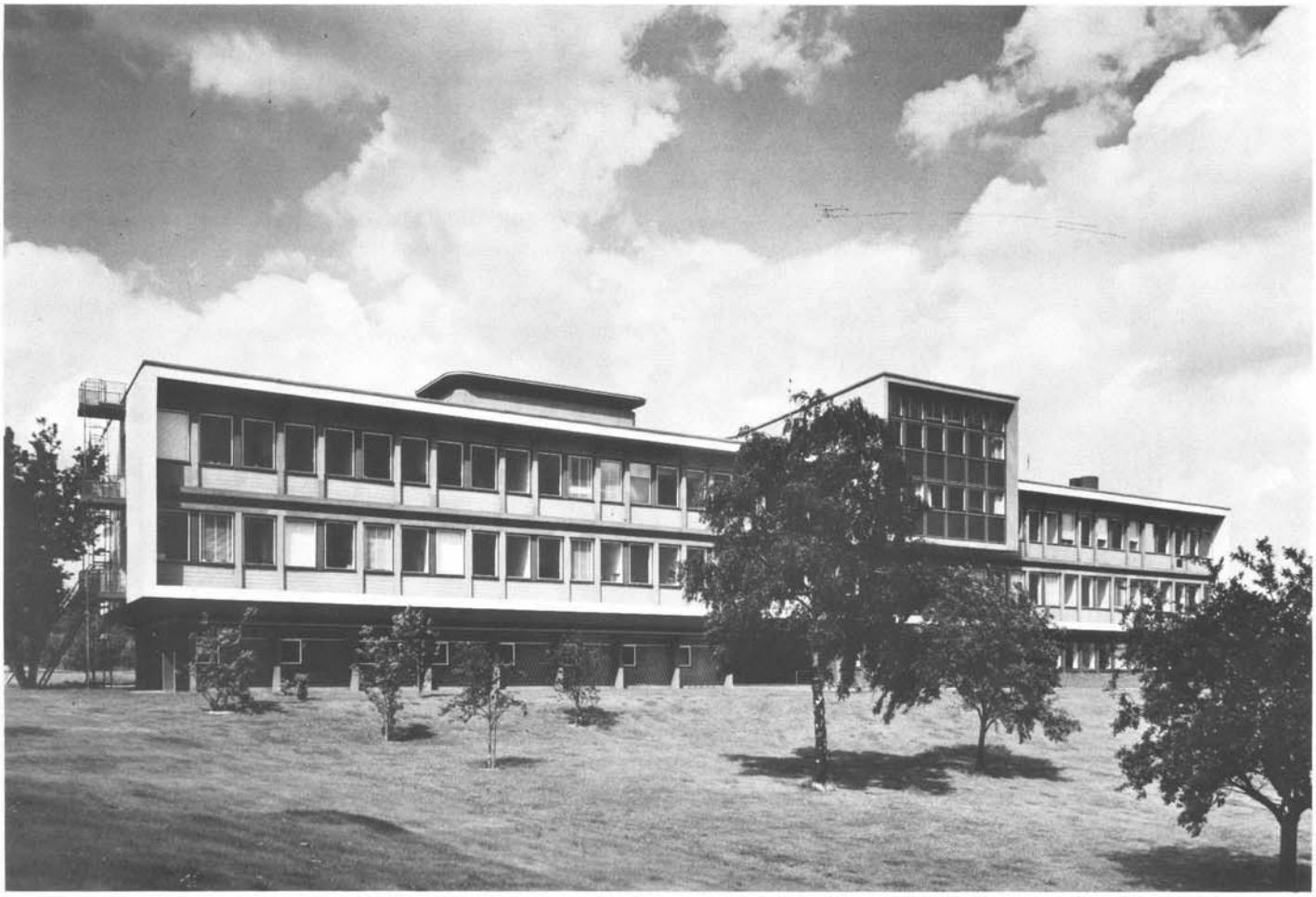
In 1939, Dr. Kaiser visited the United States for the first time. During his visit he did some experimental work with Professors R. A. Sawyer and H. B. Vincent at the University of Michigan and participated in Professor Harrison's MIT Summer conference on spectroscopy.

In 1963, 24 years after his first visit, Dr. Kaiser returned to the United States to attend the Pittsburgh Conference where he met some of the same men and women he met on his first trip.

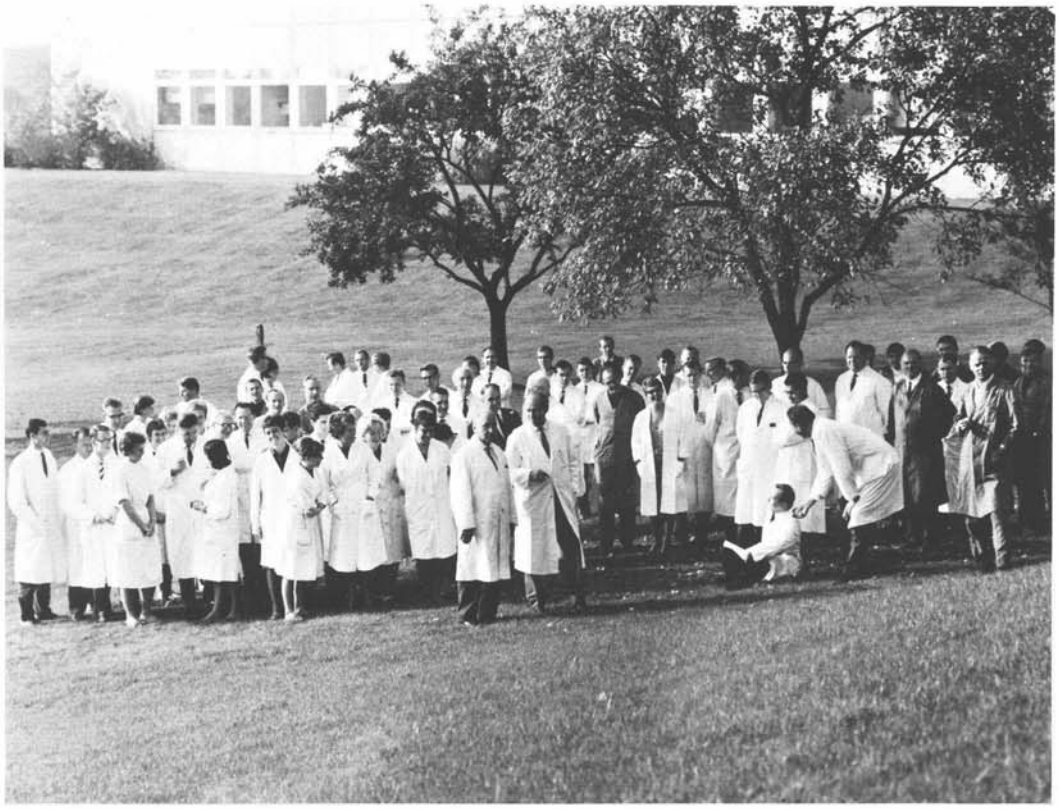
Although Dr. Kaiser now spends most of his time in directing a research institute of international fame, he does find time to do research on his own and he hopes to do more in the future. But, even if he may not participate directly in a research project, the perceptive reader can detect Dr. Kaiser's "style" in publications emanating from the Institute. The style? Asking simple questions and answering them precisely and definitively.

It should also be noted unequivocally that Dr. Kaiser is not a scientific robot; he participates fully in the pleasures provided by the fine arts. Now that he has reached the "philosophical age," he is taking a more active interest in social and political problems, particularly those concerned with undergraduate and graduate education.

Our best wishes to Dr. Kaiser and his family.



This modern building is the Institute for Spectroscopy and Applied Spectroscopy in Dortmund, Germany. It was opened in 1962, has 27,000 square feet and, as you can see, is well landscaped.



The Institute staff has rapidly grown and now numbers in the neighborhood of 100. Can you spot Dr. Kaiser?

Grating Laboratory Dedicated to David Richardson

The multi-million dollar grating and scale laboratory at Bausch & Lomb was dedicated to David Richardson, a man who devoted many years of his life to its development.

A bronze plaque, cast in the B&L foundry, was unveiled at dedicating ceremonies, and identifies the laboratory. The engraving reads:

THE
DAVID RICHARDSON
GRATING LABORATORY
DEDICATED FEBRUARY 15, 1966
IN RECOGNITION OF HIS CONTRIBUTIONS
TO THE SCIENCE AND TECHNOLOGY
OF DIFFRACTION GRATINGS

William W. McQuilkin, president of B&L, said, "In honoring David Richardson, Bausch & Lomb pays tribute to his devotion to the advancement of scientific knowledge which serves as an inspiration to us all. His personal dedication is exemplified by the fact that he has maintained communication with every one of the company's many customers, both here and abroad."

Mr. Richardson is an internationally recognized authority on diffraction gratings and has lectured extensively both in the United States and overseas. He joined B&L in 1947 as physicist in charge of research and development of gratings and other precision-ruled products, as well as spectroscopic instruments.

He received his Chemical Engineering degree from the University of Cincinnati in 1930, studied medicine at Boston University for two years, and received his M.S. in Applied Physics in 1937 from M.I.T. He is a member of SAS, the Coblentz Society, Optical Society of America, the American Chemical Society and the American Association for the Advancement of Science.

In 1948, B&L reached the conclusion that gratings were far superior to prisms for spectroscopic analysis.

"Mr. Richardson was involved in that decision," McQuilkin pointed out, "and has devoted his energies to advancement of the state of the grating art ever since." Bausch & Lomb is a leading producer of quality precision diffraction gratings.

LOOKING AHEAD

FIFTH NATIONAL MEETING for the Society for Applied Spectroscopy is the week of June 13, 1966, at the Chicago-Sheraton Hotel. (We hope this issue of Arcs and Sparks is off the press in time for you to read it before you head for this important conference.) The chairmen have been working extremely long hours to present a well-coordinated and varied program, and it promises to be one of the most comprehensive technical events of 1966. Approximately 250 technical papers will be presented. The exhibit area will be more extensive than ever, with some exhibitors conducting seminars in connection with their instruments and equipment. See you there.

BOSTON COLLEGE will conduct its annual Special Intensive Course in Modern Industrial Spectrography from June 27 through July 8, 1966. This two-week course has always been extremely beneficial to those interested in learning the techniques of emission spectroscopy for use in analytical work. Again, Rev. James J. Devlin, S.J., is Director.

ARIZONA STATE UNIVERSITY will again offer two different and distinct courses in spectroscopy during the summer of 1966. The sixth annual program in Infrared and Ultraviolet Absorption Spectroscopy, August 1-5, and the eleventh annual program in Modern Spectroscopy, August 15-26, are particularly 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.

Each program includes basic theoretical considerations and practical instrumental training, with the first course devoted principally to infrared techniques and the second to optical emission techniques. Four hours of lecture each morning will serve to present the theory, instrumentation and applications of the various spectroscopic methods. Each student will spend every afternoon working in the laboratory under the direct guidance and supervision of experienced technical personnel.

THE EIGHTH EASTERN ANALYTICAL SYMPOSIUM will be held November 16, 17 and 18, 1966, at the Statler-Hilton Hotel, New York. Chairman for the meeting is David W. Robertson, General Refractories Co. Following the successful pattern of previous years, the technical program of the 1966 Eastern Analytical Symposium will consist of selected invited papers on topics of current interest in chemical analysis and closely related fields. Suggestions for program topics and speakers are invited from all interested persons; these should be submitted to the Program Chairman, Dr. Michael Cefola, Department of Chemistry, Fordham University, New York, N. Y.

THE ROCKY MOUNTAIN SPECTROSCOPY CONFERENCE (8th Annual) will be held at the Albany Hotel in Denver, Colorado, on August 8 and 9, 1966. Sponsored by The Rocky Mountain Section of the Society for Applied Spectroscopy, this meeting immediately precedes the Annual Denver Research Institute X-ray Conference to be held August 10-12 at the same hotel. The conference this year will feature technical papers and panel discussions on: (1) Atomic Absorption, and (2) recent developments in all fields of spectroscopy. Papers will be presented on optical and x-ray emission, infrared and mass spectroscopy. Technical papers in all fields of spectroscopy are invited. A banquet and social hour will be held on Monday evening August 8, 1966. For more information contact: R. C. Reinke, The Dow Chemical Company, Rocky Flats Division, P.O. Box 888, Golden, Colorado 80402.

FISK UNIVERSITY will hold the 17th Annual Infrared Spectroscopy and Gas Chromatograph Institute from August 23 through September 2, 1966, in Nashville, Tennessee, under the direction of Nelson Fuson, Ernest A. Jones and James R. Lawson. The Institute includes two infrared sessions and one gas chromatography session. The First or Basic Infrared Session and the Basic GC Session will run concurrently in order that those attending one of the sessions can audit certain general lectures of the other session if they wish. The Second or Advanced Infrared Session may be attended by persons staying over from the preceding sessions, as well as by persons electing to come for just the Advanced Session. The most recent commercial infrared spectrophotometers and gas chromatographs, plus GC and IR accessories, will be exhibited at all three sessions.

The First Infrared Spectroscopy Session is scheduled for Tuesday through Saturday. The lectures, designed to introduce beginners to the theory and applications of infrared spectroscopy, will be given by Nelson Fuson, Fisk University; Ernest A. Jones, Vanderbilt University; James R. Lawson, Fisk University; and Kermit Whetsel, Tennessee Eastman Co. The laboratory program of this session, directed by Percy Staats, Oak Ridge National Laboratory and Dolores Phillips, Cook Paint and Varnish Co., will train participants to construct and renovate liquid and gas absorption cells, prepare solid and solution samples, calibrate and operate standard infrared spectrophotometers, and use the newer infrared techniques, such as ATR for difficult sample materials.

The Gas Chromatography Session, also Tuesday through Saturday, will be coordinated by Richard C. Juvet, Jr., University of Illinois, co-author with Dal Norgare of the well-known "Gas-Liquid Chromatography" test. In addition to Juvet's series of lectures on the basic concept of Gas Chromatography, the latest GC techniques and applications will be reported by W. Averill of Perkin-Elmer, E. Bonelli of Varian-Aerograph, Dal Norgare of DuPont, A. S. Martin of F & M Scientific, James Miller of Drew University, and D. M. Ottenstein of John Mansville. There will be a daily GC laboratory program each afternoon, coordinated by John Roth of Vanderbilt University, in which participants will construct columns, prepare samples, run qualitative and quantitative experiments on a wide variety of chromatographic units, and interpret the resulting curves.

The Second Infrared Session, Monday through Friday, gives a concentrated training in the interpretation of infrared spectra of a wide range of compounds, and an insight into the latest developments, techniques and application of infrared spectroscopy. Norman Sheppard, University of East Anglia, Norwich, England; Norman Colthup, American Cyanamid Co.; and Clara D. Smith, infrared consultant, will give the main group of lectures on interpretation of spectra. Special lectures will be given by Harry Spell, Dow Chemical Co.; Harold F. Smith, Continental Oil Co.; James E. Stewart, Beckman Instruments, Inc.; Robert F. Gore, Perkin-Elmer Corporation; and Henry Morgan, Oak Ridge National Laboratory.

The First Infrared Session and the Gas Chromatography Session are limited to 50 persons each, the Second Infrared Session to 60 persons. For further information write to: Director, Fisk Infrared Institute, Box 8, Fisk University, Nashville, Tennessee 37203.

CINCINNATI will be the scene of a Continuing Education Program on the subject of Instrumental Methods, sponsored by the Cincinnati Section of SAS in cooperation with Xavier University. The series will be held each Wednesday evening from 7 to 9:30 for eight consecutive weeks, beginning September 28, 1966, and ending November 16. The classes will be held in the Cash Room of Xavier University. Because the material covered will be basic, the program is aimed at individuals who wish to broaden their knowledge in fields other than their particular specialty. The subjects and speakers, in order of weekly presentation, are scheduled as follows: Atomic Absorption, Dr. John Dean, University of Tennessee; Emission Spectroscopy, Dr. V. A. Fassel, Iowa State University; Gas Chromatography, Dr. R. C. Barras, Atlantic Refining Co.; Infrared Spectroscopy, Dr. A. Lee Smith, Dow Corning Corporation; Mass Spectroscopy, Dr. Bruce Murray, Argonne National Laboratory; X-Ray Spectroscopy, Henry Heller, A.M.P., Inc.; Neutron Activation, Dr. James R. Devoe, National Bureau of Standards; and Nuclear Magnetic Resonance, Dr. H. A. Szymanski, Canisius College. For information contact John F. Kopp, Chairman. His address is: Federal Water Pollution Control Administration, 1014 Broadway Street, Cincinnati, Ohio 45202.

THE 1966 CANADIAN SYMPOSIUM (formerly called Ottawa Symposium) sponsored by the Canadian Association for Applied Spectroscopy will be held in Montreal, Quebec, at the Holiday Inn Hotel, October 24 through 26, 1966. An Exposition of the latest developments in spectroscopic equipment and accessories will be held in conjunction with this Symposium which will take place for the first time in Montreal, site of the 1967 World Exhibition. Arrangements have been entrusted to the Montreal Section of the CAAS.

HMAS Brisbane was launched at the Defoe Shipbuilding Company in Bay City, Michigan, on May 5, 1966. The ship will undergo about 16 months of trials and final outfitting before delivery to the Australian Navy. The Brisbane is the last of three guided missile destroyers built in Bay City.

Hometown Report

3rd Australian Destroyer Launched in Bay City; Navy Engineers Visit Ultra Carbon

HMAS Perth, guided missile destroyer built in Bay City, Michigan, for the Royal Australian Navy, undergoing trials in Lake Huron.

Construction of three guided missile destroyers for the Royal Australian Navy has been an important activity in Bay City, Michigan. The Defoe Shipbuilding Company of Bay City was awarded a contract of about $50 million to build the ships at its facilities on the Saginaw River. Total cost of the three ships is estimated at $120 million. The first of the three destroyers completed by Defoe was the HMAS Perth, delivered in July, 1965. The HMAS Hobart was delivered in December, 1965, and the HMAS Brisbane was launched in May this year, and scheduled for delivery in September, 1967.

During construction, a crew of 70 Australian Navy personnel is assigned to each ship. Many have their families with them in Bay City, bringing about 240 Australian citizens to the city.

Three of the Royal Australian Navy engineers took time out to tour the Ultra Carbon plant, just a few blocks from the Defoe shipbuilding yards. They were: John D. Lee, naval architect; Hugh M. Poole, mechanical engineer; and Barry A. Foster, electrical engineer. All are on the staff of the Australian Attache in Washington, D.C., but reside in Bay City during construction.

After the launching, several months of additional work is done in Bay City. Then the ships travel the St. Lawrence Seaway to the Atlantic Ocean, spending about seven months in U.S. waters undergoing final outfitting and sea trials.

Inspecting a few samples of Ultra Carbon products are (left to right) Hugh M. Poole, John D. Lee, Barry A. Foster, all civilians serving the Royal Australian Navy; Carl J. Leistner and Del Hughes, both of Ultra Carbon.

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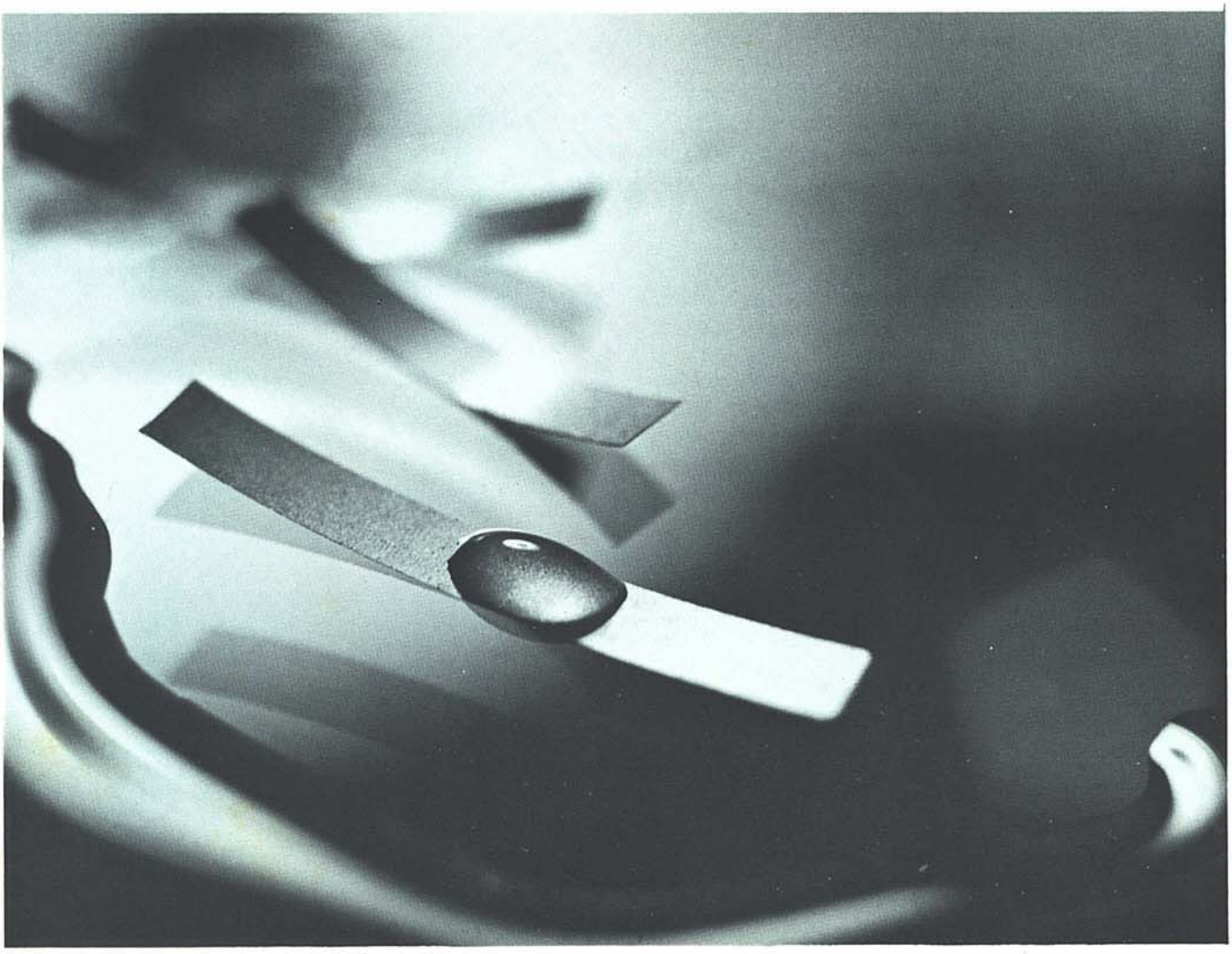

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