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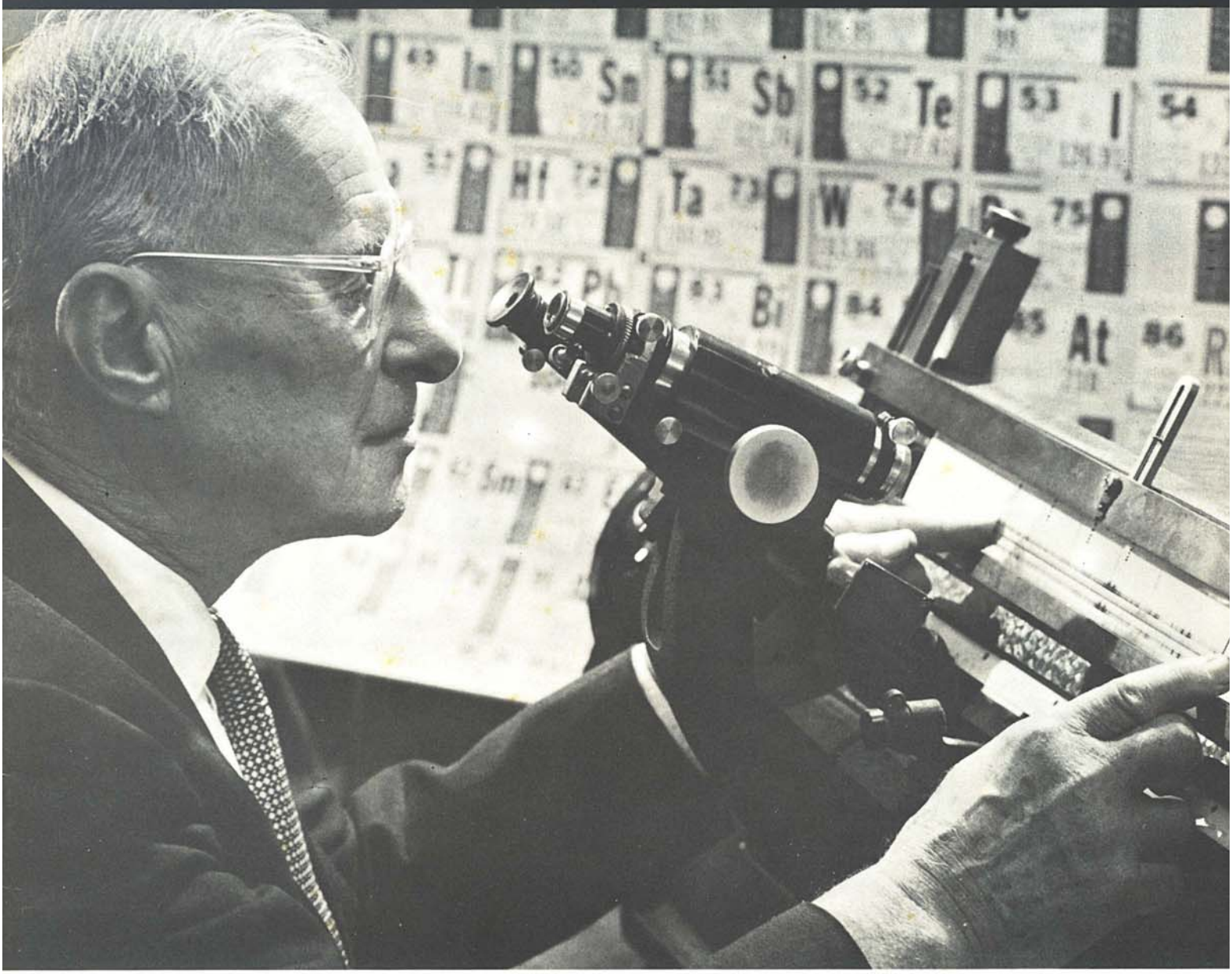
ARCS and SPARKS



DR. WILLIAM F. MEGGERS

1888 — 1966

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

What's this issue all about?

COVER STORY

This issue is dedicated to Dr. William F. Meggers who passed away on November 19, 1966.

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Harvey C. Diehl of Iowa State University was presented the 1966 award in Detroit.

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Here's a capsule listing of some of the important meetings coming up in 1967.

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Four Ultra Carbon officers have received new appointments in the organization. Page 19

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

We dedicate this issue to the Dean of American Spectroscopists, DR. WILLIAM F. MEGGERS

Asked what he enjoyed most in life, he often replied, "It's the fun of contributing to the advancement of spectroscopy."

That answer explains why Dr. William F. Meggers has made so many significant contributions to spectroscopy, why he became internationally recognized as an authority on atomic spectra analysis, and why he was thought of by many as the "dean" of spectroscopy.

It is with deep respect that we dedicate this issue to Dr. Meggers who passed away on November 19, 1966. Our sincere sympathies are extended to his family.

William Frederick Ferdinand Meggers, one of the most appreciated men for his extensive contribution to science, was born July 13, 1888, to descendants of feudal German peasants who earlier emigrated to Wisconsin and became free farmers. At the age of six, William Meggers was sent to a Lutheran parochial school, but in an action foretelling his independence of thought, rebelled after two weeks of strict religious education and was transferred to the Public School system. All during his early schooling, there was no "easy life" for Bill Meggers . . . . all his spare time was taken up with the chores and other essential farming duties. However, he has never regretted this basic education about foods and animals for it has been most helpful. Claiming that it was not the result of his innate brilliance, but simply by dint of study, he graduated as valedictorian of his high school class in 1906 . . . . and received a tuition scholarship to Ripon College.

His college days became the greatest challenge in his unfolding life, for Bill Meggers was long on ability and ambition but mighty short on money. He tucked the scholarship under his arm, picked up any odd jobs he could manage, organized a dance orchestra in which he was a triple-threat man (violin, trumpet and slide trombone), and earned the necessary money to get through school. In fact, William F. F. Meggers was the first of numerous kinsfolk to acquire a college diploma.

Like many mothers, William's had hoped that he would study medicine or law and end up with what, at the time, was considered a position enjoying the greatest prestige on the American scene . . . . but her son had developed other ideas, a practice, incidentally, he was to continue throughout his entire life.

At Ripon College, Professor William H. Barber, who taught Physics there from 1906 to 1946, had a profound effect on our young student. Through his inspiring teaching, Bill Meggers majored in Physics, received a Bachelor's degree in 1910, and spent the following year as Professor Barber's first graduate assistant. The following year was a real rough one as he slaved as a graduate student and laboratory assistant at the renowned University of Wisconsin . . . . but he earned much needed credits toward a Master's degree. About this time, his money problems again weighed heavily upon him so he became an instructor in Physics at the then recently founded Carnegie Institute of Technology at Pittsburgh.

During his second year at Carnegie Institute he happened to read a paper which changed the whole course of his professional life. Authored by Niels Bohr, it was titled "On The Constitution of Atoms and Molecules," and proposed some novel postulates to explain spectra. It was only a short time after this that Bill Meggers hied

(Continued on next page)

himself down to the Pittsburgh Post Office and spent two days writing a Civil Service examination. As the pattern of his life began to unfold in distinct form, he received an appointment as Laboratory Assistant to the late Keivin Burns, who was at the time the sole spectroscopist at the National Bureau of Standards, Washington, D. C. At the NBS, beginning in 1914, Bill Meggers persistently followed a plan of long-rage systematic research in optical spectroscopy, including improvements in standard wavelengths, accurate descriptions of atomic spectra, their applications to identification and determination of chemical elements, measurement of spectral line intensities, and other interrelated studies.

During World War I, Meggers continued both his professional and educational progress at accelerated rates. Some of his important projects covered the measuring of standard wavelengths with interferometers, photographing spectra beyond visible red, demonstration of the use of red-sensitized emulsions for photography from airplanes, other pioneer spectrochemical analysis, measuring many indexes of refraction of the atmosphere . . . . all of this while earning a Ph.D. from the Johns Hopkins University.

As an active member of the International Astronomical Union's Commission on Standard Wavelengths for some 40-odd years, he was the main contributor to secondary standards of wavelength from an iron arc measured relative to the primary standard (red radiation from cadmium). After 1947, he provided an improved primary standard (Meggers Mercury 198 Lamp) and superior secondary standards emitted by an electrodeless lamp containing thorium iodide (with R. W. Stanley).

Meggers' early efforts to extend spectrographic records toward infrared finally led to a new octane in photographic observations that all enjoy today. His experimental results on refractive indexes of air (published with C. G. Peters in 1918) served a third of a century for the derivation of vacuum wave numbers from wavelengths measured in standard air; they were replaced in 1960 by a "Table of Wave Numbers" (with C. D. Coleman and W. R. Boxman) which is expected to last another generation – if not longer.

Additionally, he was a pioneer in spectrochemistry in the new world, demonstrating its usefulness in the Department of Commerce for the analysis of metals and alloys . . . . to the Treasury Department for testing proof gold . . . . and to the Department of Justice for detecting crime. A paper on "Practical Spectrographic Analysis" published in 1922 (with C. C. Kiess and F. J. Stimson) is generally credited with reviving interest in chemical spectroscopy in which 4,000 United States Laboratories are presently engaged. Also, many years of service to Chemical Abstracts led to publication of "An Index To The Literature On Spectrochemical Analysis" (with Bourdon F. Scribner).

But, Meggers was constantly concerned about the poor quality of spectroscopic data (wavelengths, intensities, atomic energy origin) and the empiricism in suggested methods of spectrochemical analysis. Thus, simultaneously with the improvement in standard wavelengths, he tried to provide better descriptions of atomic and ionic spectra, especially of newly discovered concentrated, or artificial elements such as hafnium, rhenium, technetium, promethium, thulium, ytterbium, lutetium, actinium and the like. Since 1922, great effort has been spent on deriving atomic energy levels from structural analyses of optical spectra, culminating in the publication of three volumes of "Atomic Energy Levels" critically compiled by Charlotte E. Moore.

Finally, it became imperative to this man to make a wholesale calibration of discrete radiant powers which nearly 30 years later led to the publication of "Tables of Spectral-Line Intensities" (with C. H. Corliss and B. F. Scribner) that, for the first time, presented measured intensities of 39,000 lines (2000 A° to 9000 A°) observed in direct-current arcs exciting each of 70 metals when diluted 1000 fold in copper. In addition to calibrated intensity and spectral number, the authors hoped to give the energy levels responsible for each spectral line so that these tables would be most useful for trace analysis and for greater accuracy in quantitative determinations by selecting homologous pairs of analysis – and internal-standard lines with similar excitation characteristics.

This scientific-oriented life has not been without its awards – both numerous and of highest nature. The Optical Society made him an Honorary Member and in 1947 awarded him the Ives Medal . . . . the U. S. Department of Commerce bestowed upon him, in 1948, the Exceptional Service Gold Medal . . . . the Franklin Institute gave the Eliot Cresson Medal . . . . the New York Section of the SAS made the first award of its annual medal to him . . . . and, in 1954, the National Academy of Science elected him into membership. These are the marks of devotion to cause meticulous and laborious work, brilliance of creative concept that gave William Meggers greater satisfaction that any amount of money could buy.

The "dean" of spectroscopists enjoyed many hobbies. One of the most prized, and enjoyed, was his participation in musical offerings on either violin, trumpet, or slide trombone, which never ceased to bring back fond memories of his frugal years at Ripon College. To diversify, he thoroughly enjoyed collecting rocks, minerals, relics of the Stone Age, and had quite an imposing array. To witness the extent of Bill Meggers' avocations, in 1942 the Meggers family dedicated a private museum of Science and Civilization which was maintained in his comfortable home. A "seventh heaven" to the collector's heart, the museum is filled with hundreds of historical pieces including lamps, cameras, stereoscopes, typewriters, telephones, patent models, music boxes, phonographs, records, radios, historical movie films, and scores of other items.

Dr. Meggers retired in 1958 after 38 years of service as section chief of the spectroscopy section of the National Bureau of Standards. He joined the organization in 1914 as a laboratory assistant.

We won't even try to fill the shoes of this great man.

at the

Tenth Conference on

Analytical Chemistry in Nuclear Technology

Gatlinburg, Tennessee - September 1966

Dinner speaker, Dr. John A. Swartout of Union Carbide Corporation, New York, spoke on, "Nuclear Power Viewed from the Outside." Having previously served with the Oak Ridge National Laboratory and the Atomic Energy Commission, he is rich in experience and proved an interesting speaker as he compared the views of an administrator in each of these organizations regarding the development and use of nuclear power. Seated is M. T. Kelley, Director of the Analytical Chemistry Division, Oak Ridge National Laboratory.

Standing: F. E. Clark, Union Carbide Corporation, Carbon Products Division, Lawrenceburg, Tennessee; and D. J. Fisher, ORNL; seated: A. N. Hamer, United Kingdom Atomic Energy Authority, Risley, Warrington, England; R. M. Radford, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, South Carolina; and C. Feldman, ORNL.

(Photographs on this page courtesy of ORNL NEWS)

Standing (left to right): R. L. Graff, U.S.A.E.C., New Brunswick, New Jersey; R. E. Biggers, Oak Ridge National Laboratory; and D. O. Campbell, ORNL; seated: C. Pietri, U.S.A.E.C., New Brunswick; W. R. Tyson, E. I. du Pont de Nemours & Company, Savannah River Plant, Aiken, South Carolina; and J. A. Carter, ORNL.

Standing: J. C. White, ORNL; Nils H. Barring, AB Atomenergi, Studsvik, Nykoping, Sweden; and Leonard Newman, Brookhaven National Laboratory, Upton, New York; seated: Claude Musikas, CEN, Fontenay-aux-Roses, France; Jean G. Blachere, French AEC, Marcoule, France; and M. T. Kelley, ORNL.

at the

First Materials Research Symposium National Bureau of Standards

Gaithersburg, Maryland

October 3-7, 1966

The NBS Institute for Materials Research hosted over 550 scientists at its Symposium on Trace Characterization — Chemical and Physical, October 3 to 7, 1966. This symposium, held at the Bureau's new site near Gaithersburg, Maryland, was the first of a planned series of annual symposia on materials science.

The symposium arrangements were handled by a committee chaired by W. Wayne Meinke, Chief, NBS Analytical Chemistry Division, who was assisted by Roger G. Bates, Chief, NBS Electrochemical Analysis Section. The technical program chairman was Bourdon F. Scribner, Chief, NBS Spectrochemical Analysis Section. (See *Arcs and Sparks*, October, 1966, for related information on the symposium.)

The major part of the Symposium was devoted to a detailed consideration of ten important methods of trace characterization. For each of these methods an invited speaker summarized the present state of the art including limitations and possible means of improvement, and a rapporteur led a discussion session for contributed papers. Although only a few of the contributed papers were presented orally, all were included in a book of preprints distributed to the registrants. The rapporteur summarized the salient points of these papers and showed their relationship to one another.

This system proved effective, as it was possible to include 90 contributed papers in the program without simultaneous sessions, and to have ample time for discussion. This enabled each registrant to take part in all sessions. It also permitted the discussion to include critical comparisons of different methods of trace characterization, as well as details of individual techniques.

Topics of general interest, such as how limits of detection should be defined, were also considered. In the past, there has been little agreement on such questions. For example, various papers in one session contained detection limits measured in terms of the net signal, the ratio of signal to background, and the ratio of signal to noise. This underlined the need for agreement on definitions of such terms.

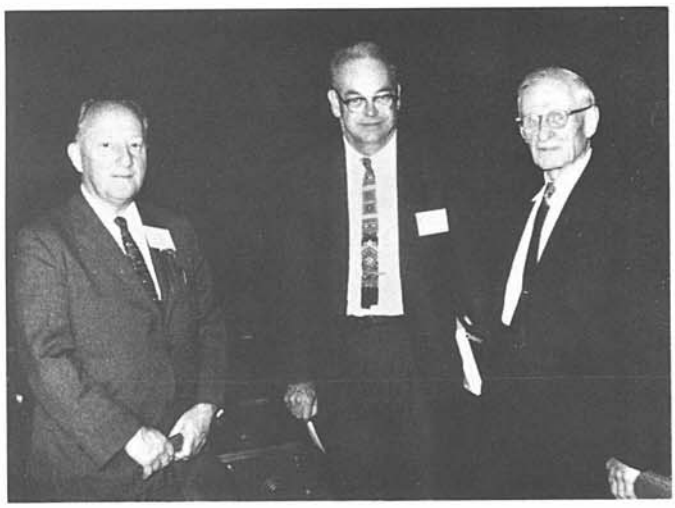
The invited lectures and summaries of the contributed papers and the discussions will be published by the U. S. Government Printing Office as NBS Monograph 100. This publication is expected to be available about April.

Alfred Simenauer (left) and M. Laverlochere (right), both Commissariat a l'Energie Atomique, France; gave an international flavor to a conversation with Mrs. Bourdon F. Scribner; and H. H. Ross, Oak Ridge National Laboratory.

Dr. H. Kaiser, Institut fur Spektrochemie, Germany; Bourdon F. Scribner, NBS; Dr. James D. Winefordner, University of Florida; and Dr. Marvin Margoshes, also of NBS. (left to right)

M. H. Hunt, Air Force Cambridge Research Laboratories; F. D. Leipziger, Kennecott Copper Corporation; W. C. Judd, General Electric; and Edward B. Owens, M. I. T. Lincoln Laboratories. (left to right)

Not all is serious at these get-togethers. Enjoying a gag about the cameraman are (left to right): Marguerite Raudenbush, NBS; Mrs. David H. Freeman; Mrs. Roger G. Bates; Mrs. Meinke; Dr. W. Wayne Meinke, NBS; Dr. Roger G. Bates, NBS; and Dr. G. E. Boyd, Oak Ridge National Laboratory.

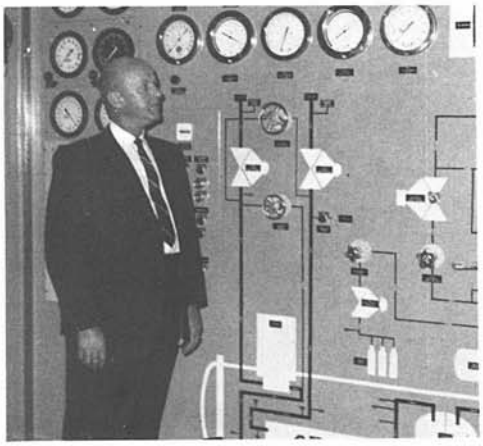


This is the last photograph taken of Dr. Meggers before his death (see Cover Story, page 3). Shown with him are Dr. Lester W. Strock (left), Sylvania Electric Company, and Dr. E. S. Hodge (center), Mellon Institute.

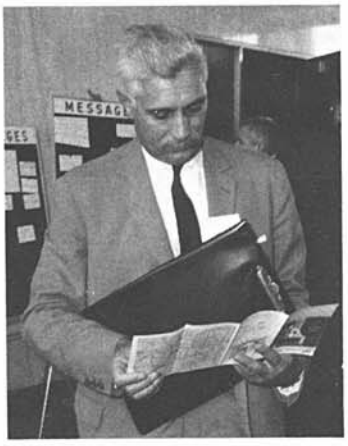
You meet people from all over . . . (left to right) Professor H. P. Yule, Texas A. & M. University; Dr. Harry C. Allen, Jr., Dr. W. Wayne Meinke, NBS; and Dr. Sidney R. Galler, Assistant Secretary (Science), Smithsonian Institution.

A Stellarator at the Smithsonian Institution provides the interesting background for this distinguished trio: (left to right) James E. Paterson, Consolidated Electrodynamics Corporation; Maurice J. Peterson, U. S. Department of the Interior; and Dr. J. T. Stock, University of Connecticut.

And the ladies always look lovely. . . (left to right) Dr. Mabel Wilson, Allied Chemical Corporation; Sarah H. Degenkolb, U. S. Steel Corporation; Mrs. Michaelis; M. D. Cooper, GM Research; Mrs. E. M. Dodson, Ministry of Aviation, England; and Robert E. Michaelis, NBS.



M. D. Cooper, General Motors Research Laboratories, viewing the Cryostat Control Panel of the NBS Research Reactor.



Invited speaker was Severin Amelinckx, Belgium Atomic Energy Center. His topic was Microscopic Methods.

L. S. Birks (foreground), Naval Research Laboratories; and H. F. Beeghly, NBS.

Professor V. A. Fassel, Institute of Atomic Research and Department of Chemistry, Iowa State University, Ames, Iowa, titled his paper, "Atomic and Molecular Absorption and Emission Profiles of Several Flames and Their Interpretation in Terms of Free Atom Formation Processes."

FOCUS ON YOU

at the

1966 ANACHEM CONFERENCE

Wayne State University

Detroit, Michigan

October 11-13

Good subjects for any photographer are E. F. Rehm (left), Geigy Chemical Corporation, McIntosh, Alabama; and Fred C. Veatch, Continental Oil Company.

Roger E. Marce (left), Allied Research Products, Inc., was program chairman for the 1966 Anachem Conference and Instrument Exhibit. With him is George E. Gullen, Wayne State University, vice president in charge of University Relations, who presented the conference address, "How is Your Second Act?"

What do you think they're discussing? Ursula Veit (left) and Adele Comerford (right), both of Parke Davis Company, compare notes with J. Heiser, Eli Lilly Company.

Four who have distinguished themselves are (left to right): Herbert C. Ward, Hooker Chemical Company; Dr. H. H. Willard, University of Michigan; Nicholas Galitzine and Garritt Dragt, both of General Electric.

Sometime in the conversation football probably came up as A. Timnick and A. McDonald, both of Michigan State University, talk with R. T. Pflaum, University of Iowa.

Happy to be at the Anachem meeting were (left) to right): Charles T. Elly, Department of the Interior; James Howell, Western Michigan University; Dave F. Boltz, Wayne State; Gary E. Sparks, Western Michigan; and Christina Sparks, Flint College of the University of Michigan.

There's a strong Iowa flavor to this picture and here's why . . . Alta Hefley, Iowa State University, Mrs. C. V. Banks, Ames, Iowa; Eugene Sallee, Proctor and Gamble Company; Geraldine Huitink, Iowa State; and Mrs. Harvey Diehl, Ames, Iowa, who is the "little lady" behind the distinguished recipient of the Anachem Award.

Dr. Harvey C. Diehl Receives 13th Annual Anachem Award

Dr. Harvey C. Diehl, right, received the Anachem Award from James Burns, Ethyl Corporation.

The 1966 Anachem Award was presented to Dr. Harvey C. Diehl of the Chemistry Department of Iowa State University, Ames, Iowa, for his outstanding contributions in the field of analytical chemistry.

Dr. Diehl was born and educated in Michigan, receiving his doctorate from the University of Michigan in 1936. Dr. Diehl joined the staff of Iowa State University as Assistant Professor in Chemistry in 1939, after having served as an Instructor in Chemistry at Cornell and Purdue Universities. In 1947, Dr. Diehl was appointed Professor of Chemistry at Iowa State University, and he holds the position at the present time. He was also appointed a Distinguished Professor in Sciences and Humanities at Iowa State University in 1965. He has not limited himself to teaching exclusivelv. During the years 1940-43, in addition to teaching duties, he served as an Official Investigator for the Office of Scientific Research and Development. Dr. Diehl completed the teaching, government and industry cycle in 1960. At that time he was elected to the Board of Directors of the Lithium Corporation of America.

Dr. Diehl has authored or co-authored seven textbooks and monographs and approximately 125 publications. His publications have dealt with chelate ring chemistry, oxygen-carrying cobalt compounds, electrodeposition with graded cathode potential control, dioxime reagents, phenanthroline reagents, EDTA titrations, metallochromic indicators, azo reagents, vitamin B_{12} and wet oxidation of organic matter.

Dr. Diehl is a charter member of the Anachems; the organization was officially constituted in 1942. He holds membership in the American Chemical Society, American Association for the Advancement of Science, Iowa Academy, Society for Analytical Chemistry, Sigma Xi, Phi Lambda Upsilon and Alpha Chi Sigma.

The American Chemical Society honored Dr. Diehl with the Fisher Award in Analytical Chemistry in 1956. He was awarded the Iowa Gold Medal Award of the Iowa Section of the American Chemical Society in 1961. This past year he was awarded the John Anderson Wilkinson Teaching Award in Chemistry at Iowa State University.

Annually the Anachem Award is presented to an outstanding analytical chemist. The selection of the recipient is based on service to analytical chemistry through research, administration, teaching, or other activities advancing this division of chemistry as a profession.

Previous recipients of the Anachem Award are H. H. Willard, University of Michigan; M. G. Mellon, Purdue University; W. G. Fredrick, Department of Health, Detroit; P. J. Elving, University of Michigan; C. M. Gambrill, Ethyl Corporation; G. F. Smith, University of Illinois; H. A. Bright, National Bureau of Standards; I. M. Kolthoff, University of Minnestota; P. K. Winter, General Motors Corporation; A. A. Benedetti-Pichler, Queens College; L. T. Hallett, Analytical Chemistry; J. L. Hague, National Bureau of Standards.

at the

Canadian Symposium on Applied Spectroscopy

Montreal, Quebec

October 1966

These people had a hand in making the Canadian Symposium a success. Seated (left to right): Mrs. S. Barabas; Paul E. Lemieux, President CAAS; E. Laliberte, official greeter of the conferees, representing the Honorable Mayor of Montreal, Mr. Jean Drapeau; and Mrs. Paul E. Lemieux. Standing: Norman Morris, Secretary-Treasurer, 1966 Symposium; Dr. S. Barabas, Program Co-chairman, 1966 Symposium; C. L. Lewis, Vice President, CAAS; L. Kuss, Exhibit Chairman, 1966 Symposium; P. A. Serin, Past President, CAAS; J. G. Carriere, General Chairman, 1966 Symposium; M. La Brooy, Registration Chairman, 1966 Symposium; and R. A. Burley, Program Co-Chairman, 1966 Symposium.

Notables (left to right): Paul E. Lemieux, President of CAAS, Aluminium Laboratories Ltd., Arvida, Quebec; Honorable P. E. Allard, symposium banquet speaker, State Minister Roads Department, Province of Quebec; and J. G. Carriere, Secretary of CAAS, Noranda Copper Mills Ltd., Montreal, Quebec.

Left to right: Dr. J. D. Kerbyson, Noranda Research Center, Pointe Claire, Quebec; C. S. Joyce, Technical Service Laboratories, Toronto; and R. H. Black, Aluminium Laboratories Ltd.

(Upper left)

This trio is: D. S. Russell, National Research Council; James W. Anderson, Consultant, Usonia, New York; and Dr. Marvin Margoshes, NBS, one of the Invited Speakers.

(Upper right)

Nova Scotia Research Foundation, Halifax, Nova Scotia, was well represented by this handsome group (left to right): Don Byers, Kenneth MacLean, Margaret Brown, Dr. H. D. Smith and Mrs. Smith. Dr. Smith is one of the directors of CAAS.

(Center left)

The ladies always brighten up things. Here we have: Dr. John Leroux, Chairman Ottawa Section, CAAS; Mrs. Leroux; Mrs. Paul Lemieux; Paul Lemieux; and John Burgener, Technical Service Laboratories.

(Center right)

Left to right: Roland Lauzon, National Research Council, Ottawa; Dr. Yoginder H. Joshi, St. Francis Xavier University, Antigonish, Nova Scotia; and P. Tymchuk, National Research Council.

(Bottom left)

Mrs. Denise Ages, Department of National Defense, Ottawa, and Dr. Sharda DasGupta, Atomic Energy of Canada Ltd., Ottawa.

San Francisco Science Symposium

October 1966

The San Francisco Science Symposium was held October 16 thru 21, 1966 at the Jack Tar Hotel. The symposium was jointly sponsored by the American Chemical Society, the Optical Society of America and the Society for Applied Spectroscopy. The OSA held its 51st Annual Meeting, the SAS held its 5th Meeting of the Pacific Coast Chapters, and the ACS held its Second Western Regional Meeting. Over 2,000 attended this large venture.

Point of interest is the CO_2 Laser Demonstration. In the center, facing camera, is Dr. Edward Teller, Professor at Large and Associate Director of the Lawrence Radiation Laboratory of the University of California, who spoke at the Optical Society Banquet on "Stimulated Emission — The Negative Shadow." Mrs. Teller is at his right. Profile in foreground belongs to S. P. Davis, Program Chairman; Mrs. Davis is at extreme right.

Getting a head start on the OSA meeting to be held in October of 1967 at the Sheraton-Cadillac Hotel in Detroit is the Program Committee. They met during the San Francisco Science Symposium. Left to right: Richard F. Majkowski, Vice Chairman and Hotel Liaison; D. J. Lovell, Major Themes; David L. Fry, Chairman; George J. Zissis, Sessions Chairman; Mary Warga, Executive Secretary of OSA; and (standing) Carl J. Leistner, Registration.

Dr. George Wald, Biological Laboratories, Harvard University, received the Frederic Ives Medal for 1966 at the dinner which was part of the Optical Society of America's Annual Meeting. Dr. S. Q. Duntley (right), President of OSA, made the presentation. Standing at left is Dr. Sawyer, Dr. John A. Sanderson, President-elect of OSA, is seated.

Dr. Ralph Sawyer, acting director of the American Institute of Physics and recent winner of the New York Section, SAS, Award (see page 14), keeps an ear to the conversation Mrs. Sawyer is having with Dr. Robert L. Boggess, Infra-Red Observatory, Maui-Hawaii.

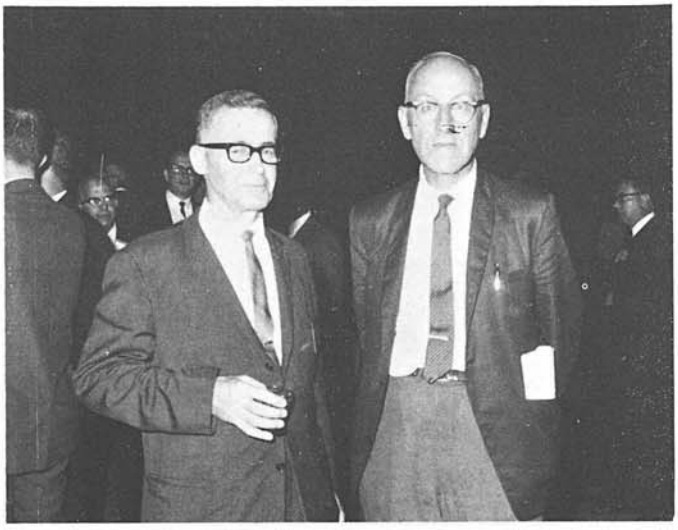
You're wrong. It's really Paul H. Lee, Perkin-Elmer Corporation, with Mrs. Lee.

T. C. Yao, Shell Development Corporation, and Mrs. Yao, chat with Donald Rea, University of California, Space Science Laboratory.

Left to right: Dr. Stuart M. Lee, North American University; Dr. George Preston, Lick Observatory, University of California; Dr. Fred M. Johnson, EOS/Zerox Corporation; and Dr. Robert C. Rosan, Stanford University Medical School.

John Faloon, Ultra Carbon Corporation's West Coast representative, gets a few bits of information about how things are going at the home office in Bay City, Michigan, from Ray Baney.

John G. Conway (left), University of California, and T. R. LeTourneau, Chevron Research Corporation, served as General Chairmen of the Science Symposium. Mrs. Conway is the gracious lady between them.



They're John K. Davis, American Optical Company and Don Laun, Kiel, Wisconsin.

Dr. Ralph A. Sawyer (left) of the University of Michigan was awarded the 1966 SAS, New York Section, Medal. Dr. Sawyer joins a select group of 14 others who have been presented the medal for outstanding achievements in spectroscopy. Ivor L. Simmons, M & T Chemicals, Inc., Publicity Chairman for the symposium, presented the award.

Ed Brame (second from left), E. I. duPont deNemours and Company, seems to have been caught passing the plate, which must be one of the new duties of the Chairman Elect. Not responding to him are Stan Kudzin (left), Academic Press; Paul Lublin (second from right), General Telephone and Electronics Laboratories, Chairman of the New York Section, SAS; and Ivor Simmons.

at the 1966 EASTERN ANALYTICAL SYMPOSIUM

Left to right: Tom Benson, Standard Brands, Inc., Peekskill, New York; Lucinda G. Timbol, Standard Brands, Stamford Conn.; Aurora G. Saluda, Argus Chemicals, Brooklyn, New York; and Martin Chiger, Standard Brands, Inc., Peekskill.

C. W. Jankowski, Northeastern University; George Peterson, Perkin-Elmer Corporation; Dave Nash, Bell Telephone Laboratories; Charles Jedlicka, Lucius-Pitkin; Jim Cosgrove and Paul Lublin, both of General Telephone and Electronics.

Left to right: Jack Enderlein, Eastern Scientific Sales; Lee Underhill, Southern Research Institute; Jim Tarapacki, Stromberg-Carlson; Richard Kohler, Eastern Scientific Sales; and Lester D. Shubin, Melpar, Inc.

Student awardees included (left to right): Bernard Olsen, Wagner College; William G. Vernetson, Loyola College (Baltimore); Alvin Melveger, University of Maryland; and Carolyn M. Thomas, Northeastern University.

Left to right: Richard Knauer, Armco Steel Corporation; Mrs. Knauer; David Robertson, General Refractories Company, General Chairman of the Symposium; Mrs. Robertson; George E. Heinze (standing), Johnson and Johnson Company, Chairman of the Analytical Group, North New Jersey Section, American Chemical Society and Arrangements Chairman for the Symposium; Mrs. Harold Pazdera and Mr. Pazdera, Treasurer, Chas. Pfizer and Company, Treasurer of the Symposium.

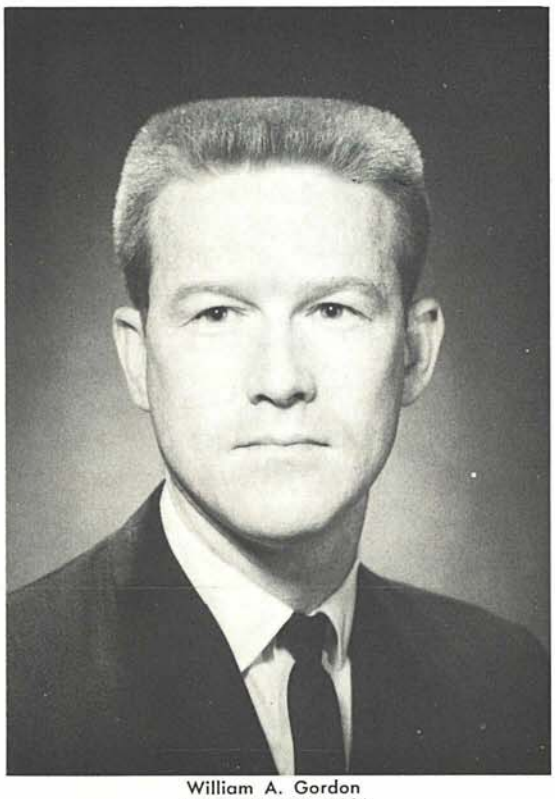
Henry Nausester, J. Bishop Company, Malvern, Pa., stops at the Ultra Carbon exhibit to talk with E. J. Musinski, one of the Ultra Carbon representatives at the symposium.

New York City
November 16 - 18

Beginning front and center, and then clockwise: Louis Beck, National Lead Company; Prof. V. A. Fassel, Iowa State University; Gerald L. Weiss, National Lead Co.; Charlie North, National Lead; Mrs. Fassel; Charles W. Shafer, National Lead; B. F. Scribner, NBS; Mrs. Scribner; and Oscar Menis, NBS.

Left to right: Donald McCaulley, Food and Drug Administration; Josephine Pechan, Analytical Chemistry; Charlotte C. Cole, American Chemical Society; and Walter W. Morris, Food and Drug Administration.

William Gordon Wins NASA Invention Award



William A. Gordon
Photo Courtesy NASA

Invention of a device to control the vaporization of material being analyzed in an emission spectrometer has won $300 and a special commendation for William A. Gordon of the National Aeronautics and Space Administration's Lewis Research Center, Cleveland, Ohio.

Gordon is a materials engineer in the Analytical Chemistry Laboratory Unit of Lewis' Materials and Structures Division.

Gordon's device allows the scientist to program the vaporization rate and the period of vaporization. This insures that the precision of analysis will be repeated on every sample.

Gordon joined Lewis in 1959. He and his wife Nadine and three children live at 20722 Royalton Rd., Strongsville, Ohio.

CONFERENCE COMMITTEE

General Chairman, D. W. Robertson ... General Refractories Co.
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SPECTROSCOPIST of the month

Dr. Harrison McAllister Randall

Harrison McAllister Randall, professor emeritus of physics at the University of Michigan, was born December 17, 1870, in Burr Oak, Michigan.

He received the degrees of Bachelor of Philosophy in 1893, Master of Arts in 1894, and Doctor of Philosophy in 1902 from the University of Michigan. In 1909-10 he studied at the University of Tubingen, Germany. He was awarded the honorary degree of doctor of science by Ohio State University in 1956.

He taught physics at two Michigan high schools: West Bay City High School (1894-95) and East Saginaw High School (1895-1900).

Professor Randall joined the faculty of the University of Michigan as instructor in 1900, becoming an assistant professor in 1905, an associate professor in 1909, and, in 1917, a full professor, chairman of the department of physics, and director of the physical laboratory. Upon his retirement in 1940 the Regents of the University of Michigan named the newly erected East Physics Building the Harrison M. Randall Laboratory of Physics.

He is a Fellow of the American Association for the Advancement of Science (vice president, section B., 1925) a Fellow of the American Physical Society (vice president, 1936, president 1937), a Fellow of the American Optical Society, Sigma Xi, Phi Beta Kappa, and Delta Upsilon.

In 1898 he married Ida M. Muma, whom he met while attending the University of Michigan. They have five children: Robert D., John R., Mrs. S. H. (Mary) Emerson, Mrs. David (Esther) Miller, and John McAllister (deceased).

Professor Randall's main field of activity was spectroscopy. His work on the arc spectra of metals with the high resolution of gratings contributed to the theory of atomic structure, then in its infancy. Following this he designed the combination prism grating spectrograph by which infrared absorption spectra of molecules to 150u were recorded. This made possible extensive theoretical investigations of molecular structure, giving the laboratory an international reputation. This period extended from 1910 to 1940 when he retired.

Coinciding with Dr. Randall's experimental work in infrared spectroscopy was development of the "Symposium in Theoretical Physics" at the University of Michigan. The discovery that atoms and molecules radiate and ab-

sorb light energy not continuously but discontinuously be "quanta" raised many problems. How to account for the spectra of atoms and molecules obtained under the numerous experimental conditions that modern facilities made possible, became the absorbing problem of the theoretical physicists and chemists of this period. The "quantum" idea itself was not understood. How the idea could be applied to account for the thousands of spectral radiations observed was very often nebulous. Those interested needed a place where they could present budding ideas, and have the advantages of discussions with others also having more or less plausible solutions. The Summer Symposia in Ann Arbor furnished this opportunity for the years between the World Wars. Some attending were recipients of the Nobel Prize. Several received them subsequently. These meetings advanced physics internationally since they brought together the ablest minds of America and Europe.

Professor Randall also collaborated in research with Professor D. W. Smith, a bacteriologist at the University of Wisconsin Medical School. On the assumption that distinct biological properties would be reflected in chemical differences, an attempt was made to classify chemically the strains of tubercle bacilli; i.e., human, bovine, avian, and some similar bacilli generally found in association with them. These latter were important as they often caused confusion in diagnosis. By means of infrared spectra of the chromatographed eluates of the lipid extracts of these bacteria, five compounds were discovered by means of which each kind of the strains studied could be identified. The five compounds characterizing the above bacterial strains are of a previously undescribed type of glycolipids, which has now received the name of "Mycoside." The methods of chromatography and infrared spectroscopy are so rapid and reliable that definite information characterizing some 138 cases of strains of the above type have been studied. The same methods are applicable to very diverse fields, hitherto prohibited by the cost of analysis by chemists.

During the first World War, while associated with physicists of the U.S. Bureau of Standards, he worked on a high frequency vibrator to detect submarines by the reflection of the short wave length radiation from their hulls. Also, with a member of the physics staff (D. W. Webster) he attempted to determine the most effective shape for floating mines.

In the second World War he headed one of four infrared groups studying the structure of the penicillin molecule. The others were at Cambridge and Oxford Universities in England and at the Gulf Oil Company Research Laboratory in this country. These four groups collaborated with numerous groups of chemists in the two countries. Their investigations ended in the successful determination of the complicated structure of the penicillin molecule.

In October, 1953, Dr. Randall was awarded the Frederic Ives Medal for Distinguished Work in Optics by the Optical Society of America. His citation for this award reads in part:

"Dr. Randall was among the few early scientists who realized fully the place of infrared in science. He recognized that the information obtained from infrared studies would add much knowledge of the electronic level systems both of atoms and molecules, and would make possible the understanding and the clarification of the structure of molecules. Our present knowledge of molecules is greatly indebted to his vision, to his personal research contributions, and to the studies of his students and of his colleagues at Michigan, and to others in countless laboratories who have followed his pioneering effort in this field of research.

Dr. Randall was named an Honorary Member of the Optical Society of America, his latest in a long series of awards for distinguished service to science, and will be presented a scroll at ceremonies on January 19, 1967, at the University of Michigan. Dean Ralph Sawyer will present the award.

"Dr. Randall was one of the pioneers in the design and construction of optical instruments for the infrared region of the spectrum. The 'Michigan' infrared spectrometers with accessories such as detectors and recorders have been duplicated, modified, modernized, and after years of use still continue on active duty in many research laboratories. 'Michigan' diffraction gratings for the infrared are also well-known contributions to optics. These and many other contributions to the field of technology have been important to the advancement of chemistry, physics, biology, and medicine, and increase our industrial productivity. Future generations of these 'Michigan' instruments will continue to advance the frontiers of knowledge and of human progress.

"This citation would be most incomplete without reference to the accomplishments of Professor Randall as director of one of the great physics laboratories which is now honored by his name. Through his most remarkable judgment of men and of fields of scientific effort, largely through his own efforts, he brought the Physics Department of the University of Michigan into a pre-eminent position among the universities of the world. In addition to the large number of his own direct scientific publications which will be recorded with this award, there are numerous grateful students, colleagues, scientists, and others who have been helped and encouraged through Professor Randall's example and assistance over the past half-century."

(We wish to thank the Journal of the Optical Society of America *and the University of Michigan News Service for assistance in compiling information for this story.)*

LOOKING AHEAD

THE PITTSBURGH CONFERENCE . . . the 18th on Analytical Chemistry and Applied Spectroscopy . . . will be held at the Penn-Sheraton Hotel in Pittsburgh on March 6-10, 1967. F. E. Dickson is President of the conference. Exposition Chairman is W. A. Straub. He may be contacted at: U. S. Steel Corporation, Applied Research Lab, Monroeville, Pa. (Telephone 412-351-3100).

MID-AMERICA SYMPOSIUM, sponsored by the Chicago Section of the Society for Applied Spectroscopy, in cooperation with the Chicago Gas Chromatography Discussion Group, is scheduled during the week of May 15-18, 1967. The 18th Annual Meeting will take place at the Chicago-Sheraton Hotel, with registration commencing in the Exhibit Hall (11th floor) on Sunday, May 14 at 7 p.m., and continuing daily during the entire meeting.

The meeting will consist of selected and invited papers from all major areas of theoretical and applied spectroscopy and chromatography. All papers are welcome; abstracts of 125-150 words are required by February 1. It is anticipated that approximately 150 technical papers will be presented, encompassing the fields of activation analysis, emission, atomic absorption, infrared and UV-visible spectroscopy, mass spectroscopy, NMR, Raman, nuclear particle spectroscopy, X-ray and gas chromatography. Special sessions and panel discussion groups on separation techniques and air and water pollution will be held. Another feature of the symposium will be a session on structures of ice, water, and aqueous solutions; Dr. Henry Frank, Mellon Institute, will be the keynote speaker for that session.

Approximately 40 exhibitors will be displaying the latest instrumental developments. There will be one hour instrument seminars describing special applications and techniques.

The committee will operate an employment bureau for the benefit of all registrants. And to round out a full and interesting meeting, there will be plant tours and a dinner-theatre party.

WESTERN SPECTROSCOPY ASSOCIATION will hold its annual meeting on February 2 and 3, 1967. And they couldn't have picked a better spot: Asilomar, situated on the tip of beautiful Monterey Peninsula in Northern California. If it's last-minute information you need, contact Dr. M. A. El Sayed, UCLA, Department of Chemistry, Los Angeles, California 90024.

LSU ANNUAL ANALYTICAL SYMPOSIUM is January 23-26, 1967. This will be the 20th International Symposium on Modern Methods of Analytical Chemistry, and again, an outstanding group of speakers will address the delegates. The Baton Rouge atmosphere is always informal, providing an excellent opportunity for delegates to receive, first-hand, the latest information concerning equipment innovations.

XIII COLLOQUIUM SPECTROSCOPICUM INTERNATIONALE will be held at Carleton University, Ottawa, Canada, June 19-23, 1967, sponsored by the Canadian Association for Applied Spectroscopy, in cooperation with SAS (USA) and Carleton University. The 1967 Colloquium coincides with the centennial year of Canada's nationhood. The organizing committee held a meeting during the annual symposium of the CAAS in Montreal in October. Below, standing, left to right: Dr. F. Claisse, Translation; D. S. Russell, Secretary; Dr. J. K. Hurwitz, SAS; Dr. A. H. Gillieson, Chairman; Miss D. Harper, Technical Program; Dr. M. Margoshes, SAS; R. Horton, Exhibits; and W. J. Bennett, Technical Program. Seated: R. Lauzon, Registration; Dr. S. Berman, Publicity; R. Ironside, Publicity; P. A. Serin, Treasurer; and P. Tymchuk, Tours and Transportation. Absent were: C. L. Lewis, Finance; W. R. Inman, Social; Dr. J. M. Morton, Accommodations; Mrs. D. J. Reed, Ladies Program.

SAM EPSTEIN ARTICLE IN SCIENTIFIC AMERICAN

Amateur spectrography has usually been limited because of the high cost of instruments. A good quality spectrograph often costs in the neighborhood of several hundred dollars.

Sam Epstein, chief chemist of the Federated Metals Division of the American Smelting and Refining Companv in Los Angeles, has designed a spectrograph that can be built at home for less than $100.

Scientific American (September 1966) has published the article by Sam detailing the construction of the spectrograph. The instrument can be used to readily identify approximately 70 chemical elements, sometimes even if their presence in a mixture of substances amounts to no more than a few parts per million. It may also be adapted for use with permanently mounted telescopes to analyze phenomena on the sun.

You'll find the article interesting reading. You may even want to build your own spectrograph.

New Appointments at Ultra Carbon

EUGENE MUSINSKI

Director of Administration and Treasurer

"Gene" has been named Director of Administration at Ultra Carbon and also retains his position of Treasurer. A member of Ultra Carbon's marketing group since 1955, he directed sales, advertising and public relations activities. This year Gene will complete 20 years of service at Ultra Carbon. Gene and his wife and 10 children live in Bay City, Michigan.

ROBERT BENDER

Administrative Sales Manager

Appointed to a new post at Ultra Carbon is Bob Bender. He has been serving as supervisor of sales administration. He joined Ultra Carbon in 1957 and has been associated with its sales department since 1961.

RAY BANEY

Manager of Sales and Advertising

Succeeding Gene as Sales and Advertising Manager is Ray Baney who was appointed Assistant Sales Manager about one year ago. Ray joined Ultra in 1958 as a quality control inspector and soon moved up to Sales Engineer. He and Mrs. Baney have two sons and two daughters.

RONALD FISCHER, JR.

Special Projects Engineer

A recent addition to the Ultra Carbon technical staff is "Ron" Fischer. His background includes a wide range of experience and skills in research, development, production and inspection. He has directed activities of quality control laboratories and has supervised inspection of metal castings. He has also been part of an Advanced Materials Group which developed and produced materials suitable for rocket nozzle technology. He and his wife have two sons and two daughters.

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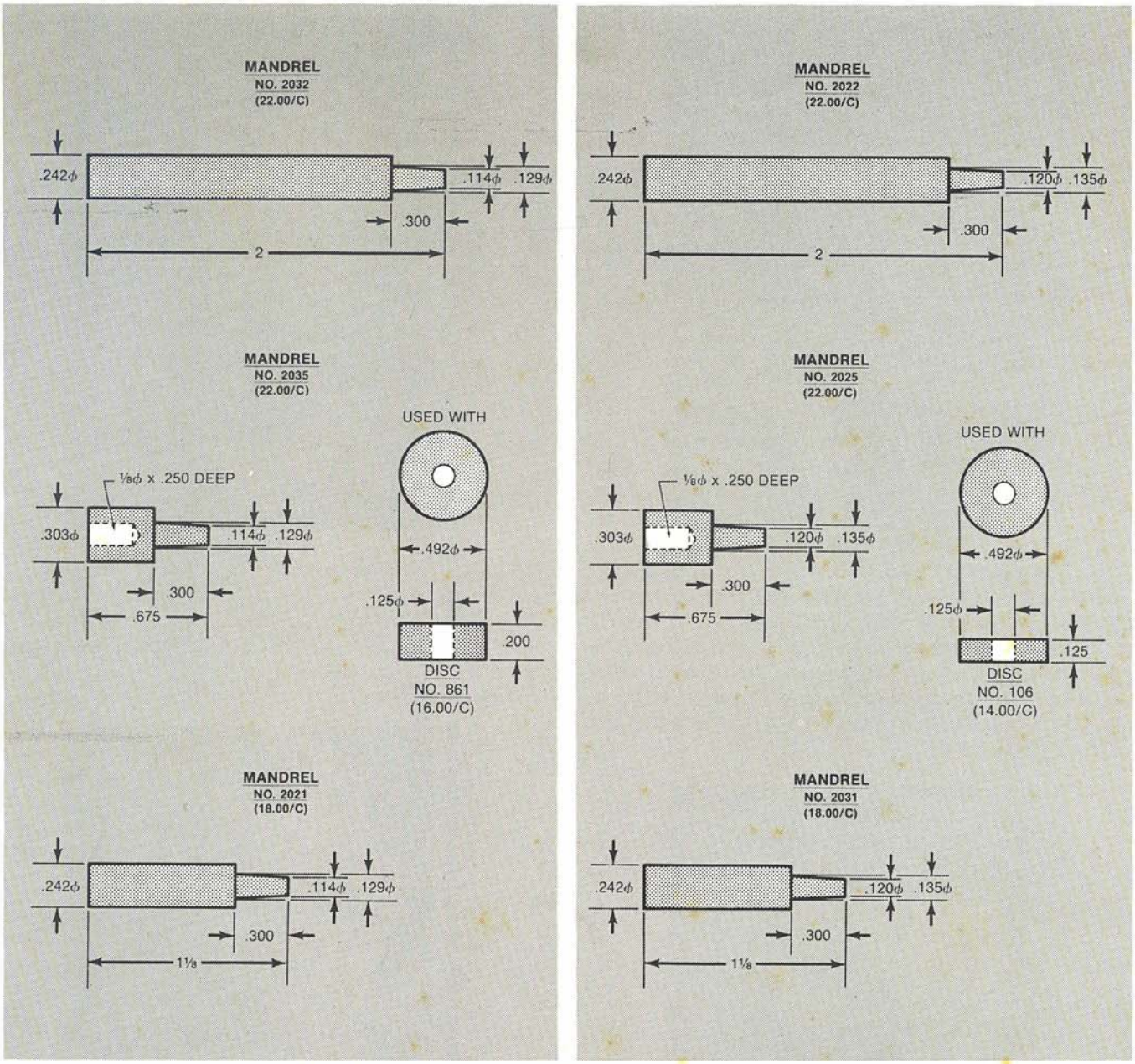

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