his the Meldola present research efforts are focussed on the ultimate aim being to exploit as studied by matrix IR/R/uv-vis/e.a.r. spectroscopies, the ultimate aim being to exploit their extremely high reactivity for synthetic and catalytic purposes. His particular interests are in the areas of (i) inorganic and organometallic synthesis using metal vapors, (ii) the activation of small molecules, (iii) the synthesis, molecular and electronic properties of small, well-defined metal clusters and cluster compounds and their relationship to adsorption and chemical reactions on metal surfaces, and (iv) catalytic intermediates and the matrix modeling of catalytic processes.

Dr. George J. Thomas, Jr., is a physical chemist. He received his B.S. degree from Boston College (1963) and his Ph.D. from MIT (1967), where he worked under Prof. R. C. Lord. A N.I.H. postdoctoral appointment took him to the Department of Biophysics, King's College, London, where he did research on the structure and function of ribosomal RNA under Prof. M. H. F. Wilkins using infrared and Raman spectroscopy. He is Professor of Chemistry at Southeastern Massachusetts University, North Dartmouth, where he continues his work on structural studies of biological molecules by laser-Raman, infrared, and ultraviolet spectroscopy; structure and function of rRNA, t RNA, and viral RNA; and RNA-protein interactions in ribosomes and small viruses. Currently he is on Sabbatical leave at Osaka University as a Visiting Scientist under the U.S.-Japan Cooperative Science Program. He has published about 30 papers dealing with the molecular spectroscopy of nucleic acids.

Coblentz Society Speakers' Bureau

We're proud to announce the initiation of a Coblentz Society Speakers' Bureau! Thirty-five of the most known and respected members of the Society have agreed to donate their time for this activity. There will be over 100 titles of talks from which to choose, ranging from popular subjects such as "Scientific Hoaxes, Art and Quantum Mechanics," special techniques such as microsampling, reflection, quantitative analysis or computer-assisted spectroscopy, to specific topics in vibrational spectroscopy of macromolecules or biological materials.

A list of speakers and topics will be available by January 1, 1976, from the Education Committee (Mrs. Jeanette G. Grasselli, Chairman, The Standard Oil Co. (Ohio), 4440 Warrensville Center Road, Cleveland, Ohio 44128). We will also publicize this activity through Analytical Chemistry, Applied Spec-
troscopy, Applied Optics, and local sections of the American Chemical Society, the Society for Applied Spectroscopy, and the Optical Society of America.

This is a volunteer effort by and from the Coblentz Society. We encourage and welcome you to take advantage of it!

COBLENTZ SOCIETY SYMPOSIUM 1976 AT CLEVELAND

RECENT ADVANCES IN TRACE ANALYSIS
BY INFRARED SPECTROCOPY

J. J. Elliott, Chairman

Thursday, March 4, Room 235A, 2 p.m.

1. Fourier-Transform Spectroscopy as Applied to Trace Analysis 40 min.

Kenneth L. Kizer
Digilab Inc.
Cambridge, Massachusetts

2. Trace Analysis by Infrared Spectroscopy Using Preconcentration and Separation Techniques 40 min.

Robert W. Hannah
The Perkin Elmer Corporation
Norwalk, Connecticut 06856

and Jeanette Grasselli
Standard Oil Company, Ohio
4440 Warrensville Centre Road
Cleveland, Ohio


William E. Herget
Environmental Protection Agency
Environmental Sciences Research Laboratory
Research Triangle Park
North Carolina 27711

COBLENTZ AWARD PRESENTATION

In a departure from the usual custom, the Coblentz Award will be presented on Wednesday, March 3, as a part of the Cleveland Awards Symposium. The program will be held in the Little Theater starting at 2 p.m., Paul A. Miller presiding. The program is as follows:

1976 AWARDS SYMPOSIUM

Presentation of the 1976 Pittsburgh Spectroscopy Award by Joseph R. Ryan, Chairman, Spectroscopy Society of Pittsburgh, to Professor William G. Fateley, Head, Department of Chemistry, Kansas State University, Manhattan, Kansas 66506.

Award Address: "The FT-IR Revolution"

William G. Fateley

Presentation of the 1976 Coblentz Award by James R. Durig, President of the Coblentz Society, to Dr. George J. Thomas, Jr., Department of Chemistry, Southeastern Massachusetts University, North Dartmouth, Massachusetts 02747, and Dr. Geoffrey A. Ozin,

Department of Chemistry, University of Toronto, 80 St. George Street, Toronto 5, Canada.

Award Address: "Spectroscopy and Metal Atom Chemistry"

Geoffrey A. Ozin

Following intermission, the Pittsburgh Applied Analytical Chemistry Award will be presented to Dr. Christopher S. Frings.

ELECTION TO THE BOARD OF MANAGERS

A ballot is enclosed for election of two persons to the Board of Managers. They will replace Drs. J. R. Durig and E. R. Nixon. Continuing Board members are Jim Elliott (Exxon Research & Engineering), Peter Griffiths (Ohio University), Bob Jakobson (Battelle Memorial Institute), and Ron Kagel (Dow Chemical). Past President Bob Bauman retires and Jim Durig continues ex officio.

ANNOUNCEMENT

The Coblentz Society, the Optical Society of America, and the Society for Applied Spectroscopy are pleased to announce the establishment of the Ellis R. Lippincott Medal. This award honors Professor Lippincott for his unique contributions to the field of vibrational spectroscopy.

The medal will be awarded annually (starting in the fall of 1976) to an individual who has made significant contributions to vibrational spectroscopy as judged by their influence on other scientists. Because innovation was a hallmark of the work of Ellis R. Lippincott, this quality must also be demonstrated by candidates for the award.

The recipient of the award will be selected by a committee consisting of one or more representatives from each of the three sponsoring societies with each society having one vote in the selection of the awardee. No restriction is placed on who may nominate a candidate for the medal and all nominations should be sent to:

Robert J. Jakobson
Chairman, Lippincott Medal Committee
Battelle-Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

The Lippincott Medal will be financed by a fund collected from industrial donations, personal contributions, and donations from the sponsoring societies. Individuals or groups wishing to contribute to the support of the Lippincott Medal should make out the checks to:

Society for Applied Spectroscopy,
Lippincott Medal and send them to:

Professor William G. Fateley
Secretary, Lippincott Medal Committee
Chemistry Department
Kansas State University
Manhattan, Kansas 66506
SPECTROSCOPIC VIBRATIONS - A NEW COLUMN IN WHICH INNOVATIONS IN VIBRATIONAL SPECTROSCOPY ARE DESCRIBED

For at least the last decade, analytical spectroscopists have looked forward to the day when measuring the infrared spectra of species eluting from a gas chromatograph (GC-IR) becomes a routine operation. Several events recently have raised hopes that the potential of GC-IR is finally being realized. Two methods for GC-IR may be distinguished -- measurement of the spectra when the samples are trapped in a gas cell and measurement when the samples are flowing through the cell ("on-the-fly").

Measuring GC-IR spectra of trapped samples does not present the problems of on-the-fly measurements, and spectra can be run on conventional grating spectrometers. Wilks Scientific Corporation some time ago developed a useful method of concentrating the material eluting from the chromatograph at low concentration in a broad peak by first condensing the material in a low temperature trap and then rapidly heating the sample and trapping it in a small-volume (<0.5 ml) light-pipe gas cell. With beam-condensing optics similar to those of ATR accessories, it is possible to measure spectra from less than 1 μg of materials on most spectrometers. Sadler Research Laboratories have taken a different approach to measuring the infrared spectrum of trapped GC peaks with their new CTRA 101 accessory. A proprietary chromatograph featuring high sample capacity and high resolution is included as part of this accessory. It also includes a valving system which permits gas flow through the GC to be stopped while the spectrum of the component of interest is measured. It is claimed that this interrupted elution technique leads to no loss in resolution in subsequent GC peaks. No beam-condensing optics are used so that the detection limits for the CTRA 101 are not low, but the nature of the chromatograph makes it possible to inject large volumes of analyte (50 μl) into the GC, so that components present at quite small concentrations can be identified.

For on-the-fly measurements, both rapid-scanning grating and interferometric spectrometers may be used. The most sensitive grating spectrometer commercially available is the Norcon 201. When this instrument was first introduced, the detection limits for most samples was of the order of 20 μg, but within the past few months a liquid nitrogen cooled mercury cadmium telluride (MCT) photovoltaic detector has been interfaced to this instrument and the sensitivity has been improved to the point that spectra of 1 μg of most samples can be measured on-the-fly (6 seconds measurement time). The use of an MCT detector has enabled the sensitivity of on-the-fly GC-IR measurements made using Fourier transform (FT) spectrometers to be increased to the point that spectra of 200 ng of most samples can be identified. Much of the recent developmental work in GC-IR with FT spectrometers has been carried out in research laboratories, in particular by Azarraga on a Digilab FTIR-14 at EPA's labs in Athens, GA, but it is rumored that at least one commercial FT instrument will be shown at the Pittsburgh Conference showing sensitivity for on-the-fly GC-IR under the order of 100 ng.

For several years it appeared that a detection limit of 1 μg was going to be the goal to reach for on-line GC-IR. Now that considerably higher sensitivity has been demonstrated, it seems likely that the general acceptance of GC-IR in the analytical laboratory will not be long delayed. The next problem to be cracked is the development of on-line infrared methods for identifying materials eluting from a high-performance liquid chromatograph.

Peter Griffiths

COBLENZ MEMBERSHIP MEETING

All Society members are invited to attend and participate in the discussion meeting to be held immediately following the Coblentz Symposium in Room 235A, Cleveland Convention Center on March 4, 1976.

Jenny Grasselli, Paul Wilks, and Bob Jakobsen are bright-eyed and bushy-tailed before the Coblentz Board of Managers meeting at Indianapolis (FACSS).

CAN ANYONE HELP?

The following people have paid dues to become Society members, but we do not have their addresses. If you know the address of any of them, please notify the Mailing Editor, A. Lee Smith, Dow Corning Corp., Midland, MI 48640.

James L. Dudby, William Fouks, Michael Huber, Klaus A. Moeckel, Bonnie Ross, Tom Siliti, and Joseph A. Vorozchikak.

DUES

If there is a CR75 after your name on the mailing envelope, it is time to renew your membership. Please use the enclosed dues card. Your prompt response will save much time and expense for the Secretary and Mailing Editor.
TACKLING REAL WORLD PROBLEMS WITH INFRARED ANALYSIS

Infrared analysis continues to find its way into unusual applications that we are sure Dr. Coblentz could not have visualized when he started his studies many years ago. Some of these are a far cry from the vibrational spectroscopy so familiar to most Coblentz Society members, yet virtually all of them are based on this science as it has evolved in infrared laboratories in the past 25 years. Here are some examples that we have been recently concerned with:

Carbon dioxide dissolved in water absorbs at 4.2 microns and can be measured using an ATR cell. The beverage industry, as it switches its packaging in large plastic containers, is faced with the dual problem of not creating an explosion hazard by adding too much CO₂ yet wanting its products to maintain their fiz "to the last drop." Solution: bottlers are making use of continuous infrared analyzers to provide a close on-stream control of CO₂ content.

Many products of the chemical industry are sold in a partially reacted form—hydrogenated vegetable oils, epoxy paints, and urethane foam intermediates are examples. Often, the progress of a reaction can be determined by infrared analysis. In the past, samples were taken to the infrared lab and the state of the reaction determined with some considerable delay and hopefully before the reaction had gone—expensively!—beyond the desired point. Today, continuous infrared monitors, again using ATR cells, are being tied directly to the reactor to follow reactions in real time.

Surgeons, anesthesiologists, and nurses have often been quite careless about the amount of anesthetic gas allowed to escape into operating rooms, sometimes with rather serious physiological results. Here again, infrared is being used to provide on-the-spot monitoring of operating room conditions. Of course, many of the other problems of monitoring working areas for toxic vapors can be handled by infrared gas analyzers.

Infrared devices are helping to clean up our waterways by measuring dissolved hydrocarbons in effluents from refineries, offshore oil rigs and tankers as well as characterizing floating films and identifying their source.

A few years ago, after two very similar accidents involving military aircraft, investigation showed that the cause was contaminated breathing oxygen which caused the pilots to become nauseous and lose their normal sensory control. The contamination came from the fact that the cockpits had been recently re-painted and solvents had been absorbed into the polyethylene hoses through which the oxygen was passed on the way to the pilot's face mask. Today, flightlines are being equipped with infrared analyzers that check oxygen purity as delivered to the pilot. The same analyzers make similar measurements on the compressed air used by divers.

It might be an interesting—and perhaps very rewarding—project for the laboratory infrared spectroscopist to make a personal survey of his own organization to learn where his knowledge and methods could be applied on-the-spot, rather than waiting for the problems to be brought to him!

Paul A. Wilks, Jr.

Q AND A

If you have a question having to do with infrared spectroscopy—techniques, interpretation, or whatever—send it to

Q & A
The Coblentz Society, Inc.
P.O. Box 9952
Kirkwood, Mo. 63122

If you need an immediate answer, please enclose a self-stamped envelope. Otherwise, the answer (by a knowledgeable member of the infrared community) will be published in the next Newsletter. It is hoped that many Coblentz Society members will participate, either by submitting questions or sharing their knowledge with a questioner.

Q: The compound with the enclosed spectrum was eventually identified as:

\[
\begin{align*}
\text{CH}_3 & \quad \text{CH}_3 \\
\text{HOOC(CH}_2)_3 \text{O} & \quad \text{(CH}_2)_4 \text{CH}_3 \\
\end{align*}
\]

At the time the spectrum was obtained we argued against the furane structure because we expected a rather prominent C-O-C vibration which we could not locate. We still do not know with certainty where it is—can somebody comment?

Q: Does anyone have a copy of

INVESTIGATIONS OF INFRARED SPECTRA

By William W. Coblentz
Published by the Carnegie Institution of Washington, October, 1905
Copyright 1902 by The Coblentz Society

that he would be willing to sell?

NOTE: This compilation of Dr. Coblentz' published papers was reprinted in 1962 by the Coblentz Society and the Perkin Elmer Corp., and sold to Coblentz Society members for $3.50. If someone is willing to part with his copy, please let Q & A know.