



# THE CHESAPEAKE CHEMIST

MARYLAND SECTION  
AMERICAN CHEMICAL SOCIETY

VOL. XXXV

APRIL, 1979

NUMBER 4





## THE EDITOR'S FIST

WHEREIN THE OLD EDITOR SAYS FAREWELL AND INTRODUCES HIS SUCCESSOR

Some two score less six months ago, this Editor took hold of the blue pencil and inaugurated THE EDITOR'S FIST in a piece with a subtitle similar to the one appearing above. Now, in keeping with a young but valuable tradition, we are stepping down.

A tradition that sets the Editor's term at three years is fine so long as there is a replacement ready and willing. Ray Petersen, who will be the Editor starting with the next issue, meets or exceeds all requirements. And his more equable temperament will assure an even closer relationship between *The Chesapeake Chemist* and the Executive Committee of the Maryland Section.

### A LA RECHERCHE DU TEMPS PERDU

Fortified by a cup of tea and a small piece of cake, we have been reading THE EDITOR'S FIST from past issues. The first one was the best, we think, although its brash naivete is a bit faded now. At the time it was written, I had only the faintest notion of what I wanted to do with the column, and no idea at all of how it would actually evolve. It did assert an independent, even an "activist," concept of its role which, while not unique among ACS local section publications, was and is uncommon.

Some members of the Section have disapproved of the fact that on a very few occasions, THE EDITOR'S FIST, and by extension, *The Chesapeake Chemist*, have expressed views contrary to the official position of the Section's Executive Committee. At least, I have been told they disapproved -- no one ever bothered to tell me so directly. In a few cases when I solicited rebuttals for publication, the requests were always declined (sometimes with thanks).

### THIS TYPEWRITER IS NOT FOR RENT

Aside from its principal function of printing meeting announcements and their related material (biographies, abstracts, etc.), *The Chesapeake Chemist* has an obligation to print anything and everything of an "official" nature, as well as any statements or comments by Section officers, committee chair-people, or any other member with something to say. This has always been done.

But some members want more. Many a time someone has said at an Executive Committee meeting, "Why doesn't *The Chemist* print an editorial on...." My answer has never varied: "You write it, and *The Chemist* will print it." But I do not write to order. The Editor of *The Chesapeake Chemist* ought not to be a hired pen, churning out hackneyed praise of chemists and chemistry and unbroken test tubes and whatnot at the whim of the Executive Committee or any of its members.

### WANTED: MORE CONTRIBUTORS

If the Maryland Section had three or four special interest groups or topical meetings, they might well generate so much material for *The Chesapeake Chemist* that there would not be any room for editorials. Or if we had more contributors like Carl Minnier....

But once the quota of "Support Our Advertisers" was filled, and there was still some inviting white space, then I claimed the right, nay, the duty, to fill it, and with something that I unblushingly say was better than 99.44% of the pap shoveled out from National Headquarters.

...cont'd on p. 9

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Ronald Kassel ..... Treasurer  
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**COVER:** Some of the people involved in the production of a typical issue of *The Chesapeake Chemist*. Top: Esther Atkins & Linda Workley of the Atkins Secretarial Service. Middle: Shirley-Fulker, Ballistic Research Laboratory. Bottom: Our express couriers race to meet deadlines by car & bike. Photos courtesy Sara Freedman, George Samos, & Ron Jopae.

### COMMITTEE CHAIRPEOPLE - 1979

Awards & National Nominations....  
Joyce J. Kaufman  
The Johns Hopkins University  
338-7417

Chemical Education....Sr. Mary Vincent  
The College of Notre Dame of Maryland  
435-0100

Program.....Howard Cohen  
Glidden Pigments Div., SCM Corp.  
633-6400

House.....Elwin C. Penski  
CSL, APG-EA  
671-3953

Member Assistance.....Joseph Cogliano  
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531-5711

Public Relations.....James Leslie  
UMAB  
528-7440

Membership.....Robert W. Kreps  
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Glen Burnie, MD 21061  
760-631

Publicity.....Richard H. Smith  
Western Maryland College  
848-7000

Remsen Award.....Dean Robinson  
The Johns Hopkins University  
338-7430

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655-5254

### BUSINESS MANAGER

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Donald Jones  
David Roswell  
Carl Minnier  
Charles Rowell

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# Minutes of the Executive Committee Meeting

Minutes of the Executive Committee meeting of the Maryland Section of the American Chemical Society held on September 20, 1978 at the Knott Science Center, College of Notre Dame, Baltimore, Md. Present: Alvin Bober, Joseph Cogliano, Howard Cohen, Merle Eiss, Frances Hummel, Don Jones, Ronald Kassel, James Leslie, Carl Minnier, Tim Parr, Bob Schneider, Ernie Silversmith, Sister Vincent.

The meeting was called to order by Chairman Jim Leslie at 7:46 PM.

The Treasurer's Report for the period January 1, 1978 thru September 20, 1978, was distributed by Ron Kassel but was incomplete due to some missing entries and therefore will not be reported until a complete accounting is available.

Jim Leslie reporting for Joyce Kaufman of the Awards and National Nominations Committee announced that this year's Maryland Chemist Award would go to Dr. Gunther Eichhorn of the National Institute for Aging's Gerontology Research Center in Baltimore and that Dr. Luigi Marzilli of The Johns Hopkins University Chemistry Department would make the introduction at the award dinner meeting to be held on Wednesday, December 13 at Notre Dame's Knott Science Center. It was also noted that anyone having recommendations for the James Bryant Conant Award in High School Chemistry Teaching should make certain that they notify Joyce Kaufman at Johns Hopkins no later than December 31, 1978.

Because of some recent occurrences, Sister Vincent of the Chemical Education Committee voiced concern over the need for more people to be aware of proper and safe ways to dispose of unwanted or deteriorated chemicals. The matter was discussed, but no definite plans were made for pursuing the matter further.

Program Committee Chairman Howard Cohen advised that the '78-'79 program was now complete and that the February '79 meeting at Notre Dame would be concerned with Information Science and Documentation. He also noted that the cost for the January '79 meeting at Eudowood would be a minimum of \$603.00 and that the Section has no other choice than to pay this amount if they intend to hold the meeting at Eudowood. Since the attendance at the January meeting is generally low (30 last year), the Section could lose a substantial amount of money if the meeting is held there. So, the alternate options would involve either cancellation of the January meeting or moving it to W. R. Grace's Washington Research Center. Howard also posed the question over whether or not it was even worth holding a January meeting in the future, and also whether or not the dinner fees should be increased because of rising costs. These matters were left open for further discussion in the near future.

Joe Cogliano, the Chairman of the Member Assistance Committee, reported that he receives about two calls per year in which requests for job openings are made whereas he receives only about one call every three years from companies who have job openings and are looking for prospective employees.

It was suggested by Chairman Carl Minnier of the Public Relations Committee that the Section support and promote programs such as "Men and Molecules" and "Taking Things Apart and Putting Them Together". One possible way to accomplish this would be to encourage the broadcasting of various chemical programs on the college radio stations that are within the Section's boundaries.

Frances Hummel indicated that the Membership Committee had added twelve new members to the Section's rolls so far in 1978. Five of these were student memberships while the others were of the regular type. She also noted that the prospective member lists which are issued by the ACS headquarters twice yearly have not proven fruitful with respect to recruiting new members.

With respect to the Remsen Award Committee, it was noted that one set of photographs taken at the award ceremony would go to the award recipient while another set would be sent to ACS for use in *C & E News*.

Al Bober, the new chairman for the Finance Committee, advised the group that this is the time of the year when the finance committee prepares a budget for the next calendar year and that within a week he would be polling all committee chairmen by letter for their inputs on what their committees spent during the year and what they would need in the way of funding for the coming year.

Student Awards Committee Chairman, Carl Minnier, informed the group that the '79 Student Awards Program would be held in March at the US Naval Academy and that letters asking for nominations would be sent out to the Colleges and Junior Colleges in the area during October.

According to Fred Gornick the final report on the MARM is not ready yet but the first draft has been distributed to all members of the MARM Committee. In summarizing the report, he said that the meeting was a success scientifically and that every paper listed in the program had been given and that there had been a high level of interest, attendance and appreciation. The final attendance figure was 985. He also noted that this meeting produced the largest surplus ever for MARM, a total of \$10,382.90, and that the \$500.00 advance from the Maryland Section had already been repaid.

With the resignation of *The Chesapeake Chemist's* Business Manager, Kent Zeller, it was announced that Merle Eiss had officially taken over the functions of that department. There was also a message from Eli Freedman, Editor of *The Chesapeake Chemist*, recommending the addition of another associate editor to take charge of one issue out of every three or four of that publication. He also learned of his intention to resign as Editor this coming June. The expense of publishing *The Chesapeake Chemist* was again discussed and in addition to the suggestion of holding costs in line by keeping the number of pages to a minimum, the idea of combining our publication with that of another in the region was advanced. This latter approach was set aside after recognizing that *The Chesapeake Chemist* is the only avenue of communications with the members and that there was a good chance of our losing our communication effectiveness if we became part of the publication of a much larger section like Washington. In another discussion it was decided that the printing bills of *The Chesapeake Chemist* would be turned over to the Treasurer for payment.

Don Jones indicated that he would be submitting his councilor's report on the recent National ACS meeting to *The Chesapeake Chemist* and then noted that most of the committee reports for action at the National Meeting were not of a controversial nature this time. He also pointed out that national billing for local section dues was postponed until 33 of 178 sections have had a chance to report on their experiences with the new program.

Under "Old Business" it was announced that a total of seven votes had been received on the revised By-laws that were published in the September '78 issue of *The Chesapeake Chemist* and that only one was not in favor. Also, the slate of proposed officers for 1979 was approved and will appear in the November '78 issue for the members to vote upon. Al Bober discussed in detail his idea about the Section sponsoring a "Chemistry Week" sometime during February '79 for all 11th and 12th graders who are interested in Chemistry as a career. During this week the students would have an opportunity to spend time in a laboratory with a chemist in the field of their interest, visit the chemistry department of a local University and attend gratis the Section's February dinner meeting. To date, Dr. Steiner of the UMBC Chemistry Department has offered to have an open house for the students with the possibility that the college might be able to pick up the cost of the lunch on that day too.

In addition, two high school science teachers and Fred Gornick have volunteered their services to the committee that would be formed. There would be no limit on the number of students who could go to the open house at UMBC but there would be a limit on the number that would be able to attend the Section's dinner meeting. With the possibility of some financial support coming from ACS's Program Development Fund, Don Jones moved that we go forward with this idea and have the "Chemistry Week" committee present a budget for the operation at the November Executive Committee meeting. Carl Minnier seconded the motion and all other members gave their consent. In the meantime J. Leslie is to contact H. Merrell at ACS to arrange, if possible, for the Section to receive some financial assistance thru the Program Development Fund. Fred Gornick is to contact high school teachers and counselors to get an input on the numbers of students that might be involved.

Under "New Business", Jim Leslie advised that he had received notice from ACS that they would collect Section dues provided the Section instructed them to do so before a July deadline. Because of the deadline and past inclination among the committee members to do this if it became possible, he gave ACS the go ahead and set the Section dues at \$4.00 per year. Upon hearing this information, E. Silversmith put the action into a motion which was seconded by Carl Minnier and unanimously passed by all present.

The meeting adjourned at 10:13 PM.

Respectfully submitted,

Bob Schneider  
Secretary

## DIRECTIONS TO WESTERN MARYLAND CAMPUS

Western Maryland College is located on the north side of Westminster. If travelling US Route 140 from Baltimore, continue on Rt. 140 until it joins Md. 97 West. This city bypass will swing around the north side of the campus. Exit 97 at Md. Route 31 going left. Again left at Md. Route 32 in about 1/4 mile. Route 32 is Main Street. The visitor entrance is the second one on the left.

## GOUCHER COLLEGE TO HONOR BELLE OTTO TALBOT

Belle Otto Talbot, Professor Emeritus of Chemistry at Goucher College, will be honored by the dedication of the Belle Otto Talbot Computer Terminal Room (203 Hoffberger Hall). The formal dedication will take place on April 26, 1979, as part of the annual Chemistry Club Banquet. There will be an open house in the Terminal Room from 4:00 pm to 5:30 pm the same day, to which the public is invited.

## COUNCIL MEETING MIAMI BEACH, 1978

The council meeting held in the Fountainbleu on September 13, 1978, was rather uneventful. There were several constitutional and accompanying by-law changes but these did not cause much discussion. *C. & E. N.* has carried the details of these and you will vote on them soon. These amendments are:

- 1) Extension of Council Policy Committee privileges to chairmen of Society committees.
- 2) Inclusion and reception of written reports in the published agenda.
- 3) Tidying up some language for "Other Joint Board-Council Committees".
- 4) Manner of election (by-law only).
- 5) Position statements by arms of the Society.

This latter point did generate some discussion, however, since it was felt by a large majority that commentary or positions taken by various Society arms should be cleared with the Executive Director. This was not to be censoring, but provide a single "clearing house" for information so that statements would not be unintentionally conflicting.

- 6) Codifying a procedure for withdrawal of petitions.
- 7) By-Law changes for appointment to Council-Related Society Bodies.

All of the above were approved by nearly unanimous votes. I voted affirmatively in all cases.

The by-law for National Billing for local section and division dues was re-committed until the Washington, D.C. meeting (Fall, 1979) so that the experience gained this year could be reviewed. (We will be one of 33 participating sections).

A request for urgent action on a by-law change for reducing husband-wife dues was denied. This required a 3/4 majority for consideration.

A resolution offered to limit reimbursement of foreign travelers was referred to the Council Policy Committee.

One new probationary division was approved and another proposed one was absorbed in an existing division. Some discussion occurred here about creation of new divisions which further splinters our resources. However, I feel that the Society must meet the needs of its members and voted in favor of the probationary division.

A new section, the Alaska Section, was approved.

Constitutional and By-Law provisions for funds apportionment and membership requirements will not be up for action in Honolulu. The proposed membership requirements change was to insert "biochemistry" wherever chemistry or chemical engineering were used. However, there are some very real problems with this wording and efforts are being made to work this out. ...cont'd on p. 8

# APRIL MEETING

WALTER E. TRAFTON, Jr.

Walter E. Trafton, Jr. received the B.S. degree from Florida State University in 1968, and the Ph.D. from the University of Illinois in 1973. He was a post-doctoral fellow at the University of Toronto from 1973 to 1975, and has been an assistant professor of chemistry at Gallaudet College since 1975.

His major research interest is in high temperature gas phase kinetics using a shock tube.

## *Abstract of Dr. Trafton's Talk*

The typical deaf student has problems not only because of a lack of hearing but also because of poor language development. Gallaudet College, the only liberal arts college for the deaf in the world, emphasizes teaching methods that will make learning easier for these students. Typical problems that will be discussed are selection of an appropriate textbook, sign language, the use of visual aids in the classroom, course curriculum, and safety in the laboratory.

JAMES ARTHUR CAMPBELL

### PRESENT POSITION:

Seeley W. Mudd Professor of Chemistry and Chairman of the Department of Chemistry, Harvey Mudd College, Claremont, California, USA.

### FORMAL EDUCATION:

A. B., Oberlin College, 1938 (Magna cum laude)  
M. S., Purdue University, 1939  
Ph. D., University of California, Berkeley, 1942

### POSITIONS HELD:

1942-45 Instructor, Manhattan Project Research, University of California  
1945-57 Professor, Oberlin College  
1947 Visiting Assistant Professor, Ohio State University  
1948 Visiting Assistant Professor, Michigan State University  
1954 Visiting Professor, University of Wisconsin  
1956-57 Program Director for Institutes, National Science Foundation  
1960-63 Director, Chemical Education Material Study, National Science Foundation  
1960-- Visiting Professor, University of California, Berkeley, summers  
1957-- Seeley, W. Mudd Professor and Chairman, Department of Chemistry, Harvey Mudd College  
1969-70 UNESCO Consultant on Science Teaching at University and Secondary School in Southern and Eastern Asia  
1974-75 Dean of Faculty, Harvey Mudd College  
1976 Visiting Lecturer, Japan Chemical Society; Visiting Professor, University of Hawaii, Honolulu (summer)

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### DATE:

Wednesday, April 25, 1979

### PLACE:

Decker Hall  
Western Maryland College  
Westminster, Maryland

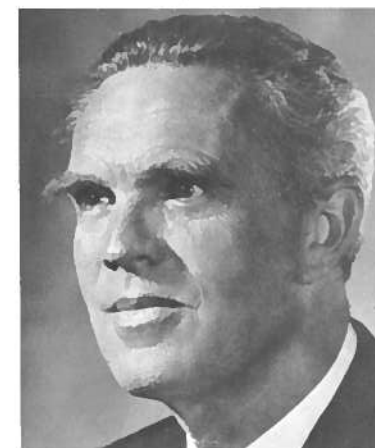
### PROGRAM & SPEAKERS:

6:00 pm  
Walter E. Trafton, Jr.  
Department of Chemistry  
Gallaudet College  
*The Problem of Teaching Chemistry to the Hearing-Handicapped*

8:30 pm  
James Arthur Campbell  
Department of Chemistry  
Harvey Mudd College  
*Surprises in the Teaching of Chemistry*

### SOCIAL HOUR:

There will be a social hour after the meeting. Refreshments will be served.



J. ARTHUR CAMPBELL

### COCKTAILS & DINNER:

Western Maryland College Center  
7:00 - 8:15 pm

Hot buffet dinner (7:00) \$7.50 per person, EXCEPT: Spouses, retired chemists and students, and their spouses, may attend the dinner at \$5.50.

### CALL:

ACS RESERVATIONS  
c/o Howard Cohen  
633-6400, exts. 7360/7203

Please make your reservations early.

It is not necessary to be a member of the American Chemical Society to attend the dinner or the talks; the talks may be attended without going to the dinner. You are invited to bring your spouse and friends to both the dinner and the meeting.



WALTER E. TRAFTON, JR.

## FINANCIAL REPORT

January 1 - December 31, 1978

Cash on Hand January 1, 1978	\$2,526.27	
<u>Income</u>		
ACS Allowance	\$1,200.00	
Receipts Advertising	1,171.50	
	<u>\$2,371.50</u>	\$4,897.77
<u>Disbursements</u>		
Mailing, Handling	\$1,065.99	
Labels		
Printer	3,226.72	
Typing	261.41	
Misc.	2.76	
	<u>\$4,556.88</u>	\$4,556.89
Cash on Hand January 1, 1979	\$ 340.88	

## MIAMI COUNCIL MEETING ...cont'd from p. 5

The Council approved Alan Nixon being on the ballot for Region VI director even though there had been an inadvertent violation of the by-laws governing nominations and elections.

The Women Chemists Committee proposed a resolution to "not hold meetings in states which had not ratified the ERA." No actual vote was taken on this resolution because the opposite of it was overwhelmingly approved in a report of the Committee on Meetings and Expositions. The rationale was that the action would be a purely political one not directly affecting the promulgation of good science and hence should be left to political action groups. The M and E report was approved by a margin of about 4-1. I voted with the prevailing side in all cases.

If you have feelings about my actions as your councilor or if you have insights into items which will appear before the Council in Honolulu, please let me know.

Donald E. Jones  
Councilor

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## Sandri Joins Alcolac As Director of Research

Dr. Joseph M. Sandri has joined Alcolac, Inc. as the company's Director of Research. The announcement was made by Mr. Charles N. Anderson, Jr., President of the Baltimore-based manufacturer of specialty chemical products.

Dr. Sandri's most recent position was President of Organic Chemicals, Inc., a custom manufacturing firm located in Grandville, Michigan. Prior to that, he was Vice President for Research and Development for Lakeway Chemicals and Director of Research and Development for Story Chemical Corporation.

Dr. Sandri is a graduate of the Illinois Institute of Technology and holds a Ph.D. in Organic Chemistry from Michigan State University.

## THE EDITOR'S FIST ...cont'd from p. 2

## HELP WANTED

It may be anti-climatic at this point, but *The Chesapeake Chemist* needs one or two more staffers. If you think the publication is poor, here is your chance to improve it. If you think it's great, help keep it that way. Call Ray or me, 7-10 pm any day. (Also, how about a cartoonist?)

I DIDN'T DO IT ALL ALONE; OR: SOME WARM THANKS

It cannot be denied that THE EDITOR'S FIST (a title, by the way, that I leave to posterity) has been a bit of an ego trip. It cannot be denied that once or twice I may even have confused one Chesapeake chemist with *The Chesapeake Chemist*. The plain fact is that getting this magazine out on time has required a lot of help from a lot of people besides the editorial staff. I want to thank all of them here. Some Section members who deserve special mention are:

Kent Zeller and Merle Eiss, past and present Business Managers during my term, for assistance with advertising deadlines, and for their toleration of my sloppy recordkeeping.

The Program and Section Chairmen during this period, Ernest Silversmith, James Leslie, and Howard Cohen, who have been unfailingly cooperative and helpful. (I say this sincerely, and I mean it, even if in the heat of battle, some hasty remarks may have indicated otherwise). As the immediate past Editor, Howard took a special interest, and I am grateful to him for having saved me from dismal errors on more than one occasion.

And thanks to two others who prefer anonymity: To a printer's representative, whose craftsmanship and judgment have always risen above the medium and the less-than-perfect input. And to an editorial consultant, the small voice over my shoulder, whose eagle eye (the cliché is inescapable in this context) spotted innumerable grammatical and syntactical solecisms; her advice was free, but it was often costly when ignored.

---finis---

## RISK/BENEFIT CONCEPT APPLIES TO FOOD SUPPLY ALSO, SAY FOOD TECHNOLOGISTS

Although there is a widespread belief that there should be no hazard whatsoever associated with the food supply, the idea of food safety includes a constant comparison between risks and benefits, according to the Institute of Food Technologists.

The risk/benefit concept is causing much debate among research scientists and regulatory agencies, according to IFT, a scientific society representing some 18,000 members. In a newly released Scientific Status Summary, "Benefit" is defined as anything that contributes to an improvement in a condition, while "Risk" is divided into the categories of "vital" and "non-vital." In developed countries, risks from food are normally far from vital or life-threatening, but zero risk or absolute safety in any area, including food, is unattainable, according to the Summary.

"The goal of absolute safety is a worthy one," the IFT Summary went on, "and some industries have approached it. For example, more than 800 billion units of commercially canned food have been produced in North America since 1940, with only five deaths attributable to botulism from that food." Yet in attempting to prove absolute safety for a process or ingredient, "the best we can ever hope for is to show no harm in every situation attempted to date, or no harm in the situation in which a material is useful."

The Status Summary describes a number of situations in which attempts to insist on absolute safety have deprived consumers of demonstrable benefits without providing freedom of choice, and it urges that a broad-based judgement as to "acceptable risks" be part of any regulatory decision. Among these instances is the proposal to ban saccharin, and questions as to whether (and how) to increase the iron content of the diet. Iron-deficiency anemia is relatively common and could be alleviated by increased supplementation of the food supply. However, a very small proportion of the population suffers from a condition known as hemochromatosis, in which they absorb more iron than they need. They could thus be endangered by increased amounts of iron in bread, for example, while most consumers would benefit.

The Summary also points out that widespread attention is being paid to

possible risks from various food additives, although far less is known about comparable or greater risks from natural components of the food supply. "Applying the Delaney clause to naturally occurring carcinogens in food would, in many cases, make specific foods unavailable," the IFT Communicator stated. "Since there is ample precedent for setting a tolerance level for a natural carcinogen in food . . . it would seem that similar reasoning could also be applied to foods containing added chemicals, if the risks were judged to be low enough."

The Summary describes the dilemma posed by compounds such as DES (diethylstilbestrol), used to fatten cattle at a faster rate than normal feeding practices would permit. DES is known to be carcinogenic, as are almost all estrogens. Yet estrogens are produced in the human body and are naturally present in many food stuffs in much larger quantities than ever found in livers of cattle fattened by this technique.

Decisions require comparison of the valuable protein produced at a saving of almost 8 billion pounds of grain feed per year vs. the predicted but undemonstrated slight increase in disease.

According to the Summary, produced by IFT's Expert Panel on Food Safety and Nutrition, "The ability of scientists to detect minute quantities of chemicals has outstripped their ability to interpret their findings. Chasing an ever-receding 'zero' level with improved analytical instruments could bring you to the ultimate questions: 'Does the presence of one molecule of a carcinogen constitute grounds for removing a food from the market place?'"

Although it doesn't propose a final solution as to how risk/benefit decisions should be made, the IFT Expert Panel points out that "Pressure on food production is increasing each year, and we will soon reach the point where every technological concept in food availability will be needed to keep up with population growth. The need for a realistic approach to the risk/benefit problem will thus become even more important."

### FOR MORE INFORMATION

Howard W. Mattson  
IFT Director of Public Information  
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## When did you last attend an ACS meeting?

J. ARTHUR CAMPBELL ...cont'd from p. 6

### RESEARCH AREAS:

Crystal structure; X-ray diffraction; infrared spectra; solution equilibria; educational films.

### PUBLICATIONS:

Numerous articles on structural chemistry, the development of nuclear power, and chemical education: *Journal of Chemical Physics*; *Industrial and Engineering Chemistry*; *Journal of Chemical Education*; *Armed Forces Chemical Journal*; *Journal of American Chemical Society*; *Acta Crystallographica*; *Chemical and Engineering News*; *Spectrochimica Acta*; and books, "General Chemistry," and "Laboratory Experiments in General Chemistry," written with Luke E. Steiner, Macmillan Co., 1955; "Why Do Chemical Reactions Occur?" Prentice-Hall, 1963; and "Chemical Systems: Energetics, Dynamics and Structure," W. H. Freeman and Co., 1969. Contributor, "Chemistry, An Experimental Science," CHEM Study. Numerous motion pictures on chemical subjects; ECO-CHEM, monthly column, *J. Chem. Educ.* "Chemistry, The Unending Frontier," Goodyear 1978.

### ABSTRACT OF DR. CAMPBELL'S TALK

### SURPRISES IN THE TEACHING OF CHEMISTRY

Almost everyone likes surprises, at least pleasant surprises. They prevent boredom, arouse interest, even encourage learning what is behind the surprises. Chemists have excellent opportunities to utilize these traits.

Chemistry has been characterized as the science of pyres, pops, and pughs, all examples of usually unpleasant, often memorable, surprises. But there are equally memorable and much more pleasant surprises available to teachers and students. Some of these will be explored with experiments and slides.

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*Thermal Transition and Thermo-Dynamic Properties*
- \* **SCANNING ELECTRON MICROSCOPY**  
*High resolution (100A) 3 dimensional microscopy*
- \* **TRANSMISSION ELECTRON MICROSCOPY**  
*High resolution (10A) microscopy of replicas and thin films*
- \* **OPTICAL MICROSCOPY**  
*Reflection, transmission, polarized, phase contrast*
- \* **QUANTITATIVE IMAGE ANALYSIS (STEREOLOGY)**  
*Particle or feature size and size distribution analysis*
- \* **ELECTRON PROBE X-RAY MICROANALYSIS**  
*Qualitative and quantitative elemental (>Be) microanalysis*
- \* **ELECTRON SPECTROSCOPY FOR CHEMICAL ANALYSIS**  
*Analysis of thin (25-50A) surface films*
- \* **OPTICAL EMISSION SPECTROSCOPY**  
*Semi quantitative and quantitative analysis of trace elements*
- \* **X-RAY AND ELECTRON DIFFRACTION**  
*Identification of crystalline compounds*
- \* **MICRO-HARDNESS TESTING (KNH & DPH)**

*All the above services are in house capabilities*

**Special Proprietary Sample Preparation Techniques  
Have Been Devised To Optimize The Analytical Data**

**For Further Information Contact J. F. Ficca Jr.**