THE CHESAPEAKE CHEMIST

MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

VOL. XXXI JANUARY, 1975 NUMBER 1

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GREETINGS FROM YOUR NEW CHAIRMAN

Greetings and best wishes for a healthy and prosperous New Year!

As I look forward to my year as Chairman of the Maryland Section of the American Chemical Society, I view it with great expectation and excitement. There are four major areas in which I hope the upcoming year will produce increased activity and participation. These areas include monthly meeting attendance, membership assistance and information, continuing education and direction for the future.

Regarding the monthly meetings, we have attempted to provide programs which would be entertaining, topical, technically satisfying and professionally current. The objective here, of course, is to present topics of interest to a broad enough group that our attendance would increase. So far, the reception has been quite good as evidenced by some excellent attendance figures. Your comments on the program and the meeting sites would be appreciated.

There are several areas of membership assistance and information to which we would like to address ourselves, the most important being employment. We do not envision any major lay-offs or reduction in demand for chemists in the Maryland area. A recent survey by Deutsch, Shea and Evans has shown an increase in the Engineer/Scientist Demand Index to 154.7 in June, breaking May's seven year high by 14.8 points. Chemistry made the biggest gain of all. However, should an individual be without a job, the Maryland Section of the ACS, through its Member Assistance Committee, will offer whatever assistance it can. Also, should you have a specific problem or experience with employment that you feel would be of interest to our membership, the pages of *The Cheaspeake Chemist* (where room permits) are available to you to communicate your story. Some of us feel that there is a need in our Section to bring together chemists with specific technical needs (in areas where they are unfamiliar) and local consultants. Accordingly, we are asking those who feel they have a specific expertise or knowledge, e.g. Mass Spec., NMR, paint chemistry, polymer chemistry, etc., to give us their name so that if any member is in need of a technical service, we can direct that chemist to an approprlate consultant. In the area of membership information, we would like to encourage the members to submit, in writing or by phone, any questions regarding the operation of the Section. Such questions are often asked at the monthly meetings, but we would like to encourage more questions via other routes. If the questions are of interest to the general membership, they will be printed in *The Chesapeake Chemist*.

Continuing education is an important priority with any professional society. We have been fortunate in having an active Education Committee and look forward to expanding its impact. We have had excellent success in presenting the ACS audio courses in the past and will again offer one this year. Steps will be taken to assure the Section's expansion of its library to audio courses which will be offered free of charge to groups within our Section. If proper arrangements can be made, they will also be made available to individuals. Suggestions have been submitted which would entail a full series of lectures. Many details have to be explored before making a commitment on these proposals.

Finally, there should be some definite financial guidelines for the upcoming years. With this in mind, a Finance Committee has been appointed to explore questions such as: where our cash reserves should be invested, what kinds of expenditures are necessary to maintain our tax-free status, what limitations should be set on speaker and meeting expenses, the amount of money we can afford to allocate to our publication, etc.

During the next few months, you will be seeing details of the above proposals in the pages of this publication. Our activities and goals are devoted to service to the membership. Your participation is essential and your comments and suggestions are welcomed.

A. Allen Bednarczyk, Chairman
Maryland Section, ACS

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The Chesapeake Chemist is published monthly September through May by the Maryland Section of the American Chemical Society. Address editorial comments to Howard J. Cohen, Glidden-Durkee, Div. of SCM Corp., 3901 Hawkins Point Road, Baltimore, Md. 21226. Phone 633-6400. Address advertising inquiries and copy to Kent R. Zeller, McCormick & Co., Inc., 204 Wight Ave., Hunt Valley, Md. 21031.

MARTIN M. McLAUGHLIN

Martin M. McLaughlin received his Ph.D. in Political Science from Notre Dame in 1948. After graduation, he taught at DePaul University in Chicago. For twenty-three years, Dr. McLaughlin served in the Federal Government in the State Department and AID. He also taught part-time at George Washington University and the University of Maryland. Currently Dr. McLaughlin is a Senior Fellow at the Overseas Development Council as well as Executive Secretary of the World Hunger Action Coalition.

WORLD FOOD CRISIS

The major topics to be covered in Dr. McLaughlin's presentation will be: The World Food Conference - issues; the U.S. position on the ten major issues; how the world got to the crisis situation; why it is a problem the U.S. must take the lead in solving; the results of the World Food Conference and the follow-up until January 15, 1975; what the private citizen, individually and through his organizations, can do about it; the implications of failure; other global problems to which it is related.

RICHARD L. HALL

Richard L. Hall was born in Roseland, Nebraska. He received his S.B. in 1943 and his A.M. (1948) and Ph.D. (1951) degrees in chemistry from Harvard University. He has been with McCormick & Co., Inc. since 1950 and currently is Vice President-Research and Development.

Dr. Hall's professional affiliations include: Past President of the Institute of Food Technologists; Past President of the Flavor and Extract Manufacturers' Association; Member of the Panel on Chemicals and Health, President's Science Advisory Committee; Chairman, Third International Congress of Food Science and Technology; Vice Chairman of the Panel on Food Quality, White House Conference on Food Nutrition and Health. Dr. Hall is also a Fellow of the AAAS and of the Institute of Food Technologists. He is an Honorary Member of the Society of Flavor Chemists and member of the ACS, Society of Toxicology, New York Academy of Sciences, and other professional and scientific organizations.

SAFE AT THE PLATE

Food Safety in a Changing World

If we are to address ourselves sensibly and effectively to the topic of food safety, we must consider both broad questions of context and perspective, and narrow questions of fact on individual problems.

The past 50 years have seen drastic changes in public health, in food production and processing, and in our appreciation of sources of hazard in our environment.

Our reaction to questions of hazard and safety in food is a part of our more general concerns. Six specific categories of food hazard require our attention: microbiological and nutrition hazards, hazards from environmental pollutants and natural toxicants, and those from pesticide residues and food additives.

To deal effectively with them, we will always need more information--science never stops--but we also need wider and deeper public understanding, and more efficient methods of achieving such understanding.

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EMPLOYMENT OPPORTUNITY

Chemist required with industrial pesticide residue analysis experience. Work entails analysis of food products for chlorinated hydrocarbon residues and other pesticides. Contact:

Philip A. Guarino, Manager
Corporate Analytical Services
McCormick & Company, Inc.
539-6460

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GALBRAITH
LABORATORIES, INC.
P. O. Box 4187
Knoxville, Tenn. 37921
(615) 546-1335
HARRY W. GALBRAITH, Ph.D.

JANUARY MEETING

EVENT:

Joint meeting with Maryland Section of the Institute of Food Technologists.

DATE:

Wednesday, January 15, 1975

PLACE:

Eudowood Gardens Lecture Room, Eudowood Plaza, Joppa Road near Goucher Boulevard.

SPEAKERS AND TOPICS:

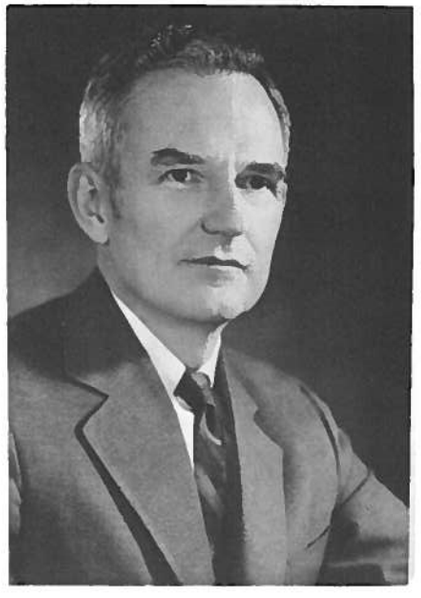
5:30 P.M.
Dr. Martin M. McLaughlin,
Overseas Development Council:
"World Food Crisis"

8:30 P.M.
Dr. Richard L. Hall,
McCormick and Co., Inc.:
"Safe at the Plate.....Food Safety in a Changing World"

SOCIAL HOUR:

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

DR. MARTIN M. McLAUGHLIN



DR. RICHARD L. HALL

COCKTAILS AND DINNER:

Eudowood Gardens Dining Room
Cocktails 6:30-7:15 courtesy of McCormick and Co., Industrial Flavor Division
Hot buffet dinner (7:15) $5.50 per person. Retired chemists, students and their spouses may attend the dinner at $3.50 each. Reservations are necessary for the dinner and should be made by mail or phone with

Dr. Allen Bednarczyk
McCormick and Co., Inc.
204 Wight Avenue
Hunt Valley, Maryland 21031
Phone 667-7480, 667-7470
Ask for ACS reservations.

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

SEDIMENTS OF THE CHESAPEAKE BAY

The estuarine system which we call the Chesapeake Bay is a complex depositional basin for sediments that, for the most part, were physically derived from outside the basin. Although there are locally interesting accumulations of biochemically and inorganically precipitated materials, representative samples of Bay sediments feature a mixture in various proportions of clay, silt, sand, and even gravel, loosened and carried away from bedrock cropping out within the watershed. In the lower Bay, another source of sediment is the sand moving along the Atlantic coast and swept into the estuary by tidal currents.

Mineral compositions and grain sizes (textures) are distributed in a geographical pattern related to the (1) origin of the Bay (2) circulation pattern within the estuary and (3) climate, slopes, and exposed rock types throughout the watershed.

Since the melting of the last continental ice sheets began (approximately 15,000 years ago), sea levels have risen at a decreasing rate by 125 meters, drowning continental shelves and contiguous river valleys. Thus, the ancestral Susquehanna River and tributaries, already choked in glacial-fluvial sediments, were transformed into a lower-energy estuarine system, dominated hydrographically at the head by river flow and fluvial sedimentation and at the mouth by tidal currents, winds, and Coriolis effects. An interesting and ecologically important circulation pattern developed in the lower Bay whereby the incoming saltier waters first wedge under, then mix upward with the less dense fresher outflow. This two-way current and mixing promotes turbulance and homogenization of the finer-grained sediments in the lower Bay, while at the head of the Bay and tributary estuaries, deltas such as the Susquehanna Flats choke the basin with relatively rapidly deposited sediments that are slowly being reworked and redistributed by tidal currents. Except for local fluctuations, currents have distributed clayey and sandy silt over most of the Middle Bay grading shoreward into fine sands and occasional gravels.

The watershed of the Chesapeake Bay is directly underlain by Paleozoic sedimentary rocks (Appalachians); Precambrian and Paleozoic metamorphic and igneous rocks (Piedmont); and Mesozoic and Cenozoic poorly consolidated sedimentary rocks (Coastal Plain). Because the Bay lies totally within the Coastal Plain, the direct contribution from that source is obviously enormous. However, rocks of the Coastal Plain are themselves composed of materials derived from the older Appalachians and especially the older and adjacent Piedmont; sediment derived from the Coastal Plain is actually experiencing its second cycle of weathering, erosion and deposition. Thus, statements as to the ultimate origin of a particular grain of sand in the Chesapeake Bay are highly speculative although certain mineral characteristics and associations have proven useful and a few comments on these as found in Bay sediments should be made.

Sedimentologists often divide minerals into those that are resistant to abrasion versus those that are not thereby separating minerals which survive two cycles of weathering, erosion, and deposition from those which probably do not. Another useful partition divides heavy (specific gravity greater than 2.7) from light minerals, the rationale being that everything else being equal, minerals of the same specific gravity have a measure of hydraulic equivalance: they are transported and deposited together. Using these criteria of classification, the most common minerals in the Bay are listed as follows:

	RESISTANT	NON-RESISTANT
Light Minerals	Quartz Chert Feldspar	Muscovite Mica Kaolin, Illite, Mixed-Layer Clay
Heavy Minerals	Ilmenite Staurolite Zircon Tourmaline Garnet	Chlorite Epidote Hornblende

The "lights" comprise between 90 and 99% of every (bottom or beach) sample we have ever studied for any purpose although 1 to 2-meter-long "pay streaks" on Calvert County beaches have been estimated to contain perhaps 20% ilmenite. Quartz dominates the "lights" and is often (30%) optically strained, indicating a metamorphic origin, but more often (65%) is not strained presumably implying an igneous source; sometimes (3-5%) quartz contains abraded overgrowths of chemically precipitated silica, indicating it had been previously deposited and cemented. The chert is derived from the Paleozoic limestones of Appalachia. The principal clay minerals, kaolin, illite, and mixed-layer clays are derived ultimately from the weathering of aluminosilicates, principally the feldspars of the Piedmont. Illite and mixed-layer clays are also second cycle, eroded from the Paleozoic shales of the Appalachians.

Zircon and tourmaline may be from any of the source areas, although various colors of tourmaline reflect diverse crystallization environments and work should be done on tourmaline variety distributions. The garnet type is almandite, again a definite metamorphic mineral from the Piedmont. Ilmenite is the most prevalent heavy mineral and is derived from the crystalline metamorphic rocks of the Piedmont. Non-resistant "heavies", epidote, chlorite, and hornblende are common hydrous silicates found in a metamorphic terrain such as the Piedmont.

Studies on estaurine sediments have become increasingly directed toward environmental objectives. A list of the more exciting biogeological studies might include: dispersal and distruction of oil and the effects of oil on benthic animals in the sediments; adsorption and desorption of heavy-metal (Co, Cd, Au, Ba, Zn, Pb, Cu) pollutants in clay mineral systems; behavior of sulfate-reducing bacteria in muds; radioactive isotope diffusion through water and sediment; role of sedimentation in euthrophication; accumulation of carcinogenic hydrocarbons in bottom sediments.

Dr. Henry G. Siegrist, Jr.
Geology Department
University of Maryland, College Park

HIGH HOPES AT HARVARD

by Alan C. Nixon

At this writing I am just about to take off for a conference on Certain Current Problems in the Field of Ethics and Science. This is sponsored by a Harvard University program on The Public Conceptions of Science. One of the items on the conference is a discussion of a sweeping and controversial document prepared by UNESCO entitled "Status of Scientific Research Workers." This document ranges over a wide variety of topics including scientific research in the context of national policy making, and the civic, ethical, and international aspects of scientific research. It raises issues concerning the rights and responsibilities of scientists and their employers, conflict between the openness of science, and the "occasional" need for confidentiality, the ownership of scientific results, etc. This is very much along the line of things that have been of concern to the ACS in recent years. The document has been under preparation for several years and is now in its final draft with the idea that it should be adopted in the next year or so. It undoubtedly will stimulate a great deal of discussion and controversy. One of the chief problems is: supposing it is adopted-how will it be implemented? This, of course, is the same problem that we have with our Guidelines for Employers, and points up the necessity of having the basic guidelines established by law. Incident to this is the news that Louis McIntire has lost at least a preliminary skirmish in his $20 million suit against DuPont because the Texas Supreme Court declared the Texas worker's Bill of Rights law unconstitutional. Nevertheless, Louis intends to press on.

From *NICK-NACKS*
December 1974

COPY DEADLINE

Copy for the *Chesapeake Chemist* should be forwarded to the Editor not later than the fifth of the month preceding publication.

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HOW CAN OCTANE GRADES SAVE ME MONEY?

If your car is a 1972, or prior year model, you can select a gasoline that operates it satisfactorily, and for the least money by the following procedure:

1. Observe the grade on the pump from which you now purchase gasoline that operates your car without knocking.
2. The next time you need gasoline let the tank get low and add about 1/4 tank from a pump identified by the next lower grade.
3. If your car does not knock on this gasoline, the next time you need fuel buy about 1/4 tank of the next lower grade.
4. Continue to drop to the next lower grade until the car begins to knock. Then move back up to the next higher grade. This should satisfy the antiknock requirements of your car at a minimum fuel cost.

Don't be alarmed if your car "pings" slightly during rapid acceleration, or a short hard pull. When operating at maximum efficiency under normal driving conditions, such a "ping" will occur under these temporary abnormal conditions.

As cars become older antiknock requirements can increase due to engine deposits, and you may find it necessary to move up to a fuel of higher octane grade designation to operate your vehicle "knock free".

STATE OF MARYLAND
COMPTROLLER'S OFFICE

ACS MEETING

The 7th Central Regional Meeting will be held on May 28-31, 1975 at West Virginia University, Morgantown, West Virginia. The featured speaker will be Sir Derek Barton, FRS (Nobel Laureate, 1969). Symposia in the areas of new organic reactions; organic reaction mechanisms; active principles of plants; high pressure liquid chromatography; structure and function of biological membranes; sulfur chemistry, theory and practice; energy forms; glass and ceramics; and polymer chemistry. Papers may be submitted to Dr. Gabor B. Fodor at the above address.

GC-MS WORKSHOP

The Washington Chromatography Discussion Group will sponsor a 2-day workshop on Gas Chromatography-Mass Spectrometry on March 26 & 27, 1975. Emphasis will be placed on instrumentation and techniques for efficient GC-MS operation. This will include two 1/2-day laboratory sessions. One session will emphasize the increasing role of computers in this field. Enrollment will be limited. For further information contact Harry Hertz, 301-921-2154.

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Inflation is so bad that when a man asked for a dollar's worth of gas the attendant sprayed a little behind his ear.

Minnesota Chemist

TEAR-OUT DINNER RESERVATION FORM

There is enclosed $ ($5.50 per person)* for dinner reservations at Eudowood Caterers, Eudowood Plaza, for the following persons.**

Name (Please print or type)	Affiliation
_____	_____
_____	_____

*Please make checks payable to Maryland Section, ACS and mail together with reservation form to Dr. Allen Bednarczyk, McCormick and Co., Inc. 204 Wight Avenue, Hunt Valley, Md. 21031, or phone 667-7480, 667-7470. *Ask for ACS reservations.*

**Return by Friday preceeding next meeting.