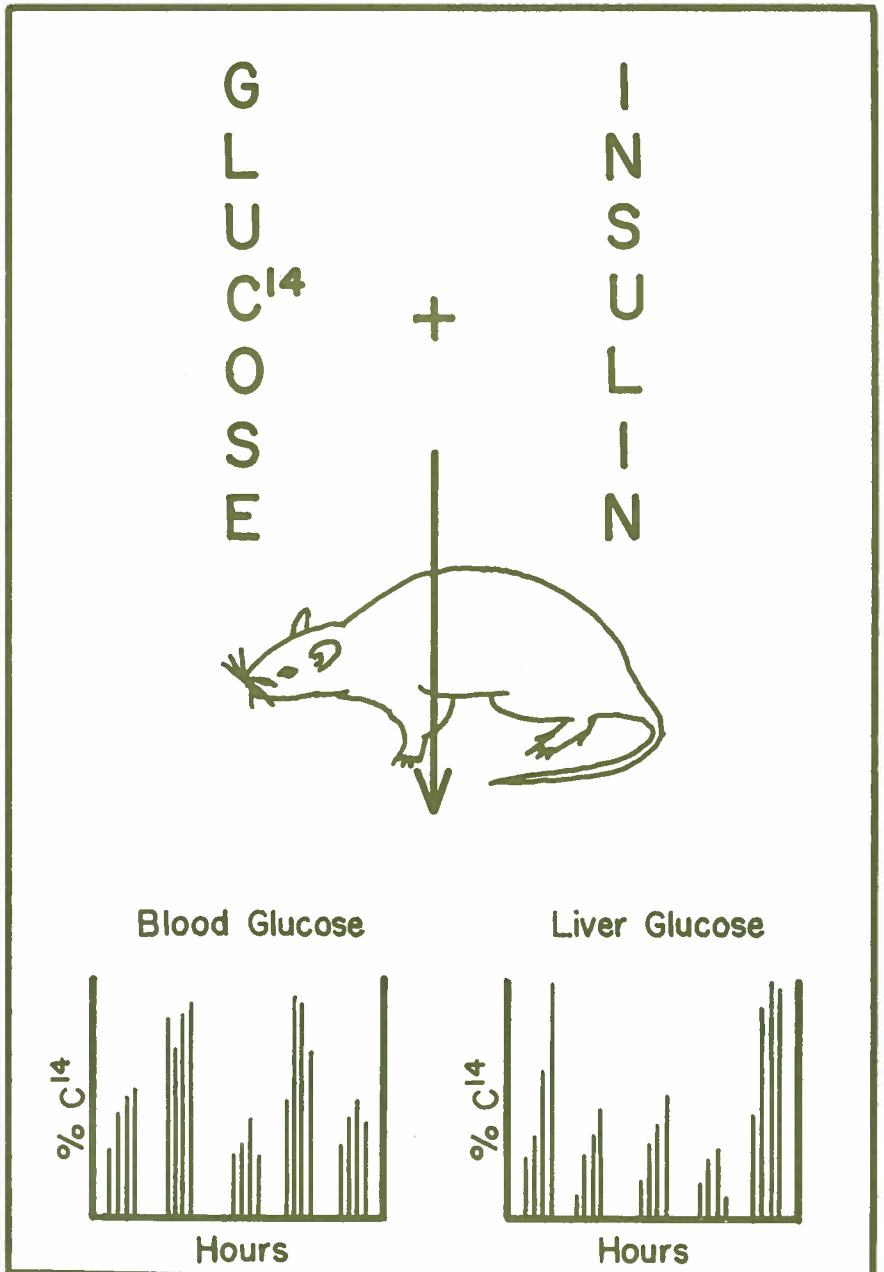
MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

THE CHESAPEAKE CHEMIST

VOL. XXII | DECEMBER, 1966 | NUMBER 9



The officers of the Maryland Section

and the staff of

THE CHESAPEAKE CHEMIST

wish all of you

A Very Merry Christmas
and
A Happy New Year

THE CHESAPEAKE CHEMIST

VOL. XXII DECEMBER, 1966 NUMBER 9

CONTRIBUTORS TO THIS ISSUE

R. J. Allgeier
Fort Detrick
A. Bober
U. S. Customs Laboratory
H. K. Livingston
Wayne State University
Jean Stuart
The Johns Hopkins University
Phyllida Willis
Hood College

IN THIS ISSUE

The Chesapeake Chemist is published monthly September through May by the Maryland Section of the American Chemical Society. Address editorial comments to Lt. Col. Kenneth S. White, University of Maryland, 636 W. Lombard St., Baltimore, Md. 21201. Address advertising inquiries and plates to Lionel Katzoff, Sinai Hospital of Baltimore, Inc., Belvedere Ave. at Greenspring Ave., Baltimore, Maryland 21215.

DECEMBER MEETING

Please observe change of Meeting date!

DR. JOHN EISCH

DR. SIDNEY WEINHOUSE

DATE:
Wednesday, December 21, 1966

PLACE:
Eudowood Gardens Lecture Room, Eudowood Plaza, Joppa Road, near Goucher Blvd.

SPEAKERS AND TOPICS:

5:30 P. M. **Dr. John Eisch**
Catholic University of America
"Organometallics—Chemical Consequences of Unsaturation in Organoaluminum Compounds"
(see page 15).

8:30 P. M. **Dr. Sidney Weinhouse**
Temple University Medical School
"Insulin and Metabolism of Glucose"
(see page 7).

Biography of Dr. Eisch is on page 14 and that of Dr. Weinhouse is on page 14.

COCKTAILS AND DINNER:
Eudowood Gardens Dining Room. Price is $3.50 per person for cocktails (6:30-7:15 P.M.) and dinner (7:15 P.M.). Free parking. Reservations must be received no later than December 17. Use reservation form on page 18. We encourage you to bring your wife and friends to both the dinner and the meeting.

SOCIAL HOUR:
There will be a social hour after the meeting. Refreshments will be served. All are welcome.

Cover
Glucose Metabolism, by Sibyl L. Bane and George E. Swindell.

INSULIN AND METABOLISM OF GLUCOSE

Insulin is a polypeptide having 51 amino acids in two chains, held together by two disulfide bridges. In contrast with our detailed knowledge of its chemical structure, we still know little of the nature or sites of its biological action. Perhaps the only non-controversial effect is that it lowers the blood glucose when injected into animals. Well-documented evidence of recent years indicates that insulin lowers the blood glucose by stimulating the transport of glucose across the cell membrane of muscle and adipose tissue. However, it has long been recognized that the steady-state level of blood glucose is maintained by a balance between the release of glucose synthesized in the liver and its uptake by peripheral tissue. Therefore, the lowering of blood glucose might just as well be due to suppression of glucose release as to stimulation of glucose uptake. The work of Dr. Weinhouse and his colleagues during the past seven years has shown that an action of insulin in suppressing the release of glucose from the liver plays an important part in regulating the blood glucose level.

These findings resulted from studies of blood glucose replacement rates, using tracer techniques. Since the blood glucose is constantly undergoing replacement, the rate of these processes can be estimated by labeling glucose with carbon-14 and measuring the rate of drop in radioactivity with time. Such studies, carried out in human volunteers, showed a constant replacement rate of about 40-50% per hour. A further refinement in the methodology, using glucose labeled in carbon 6, made it possible to distinguish between glucose synthesized directly from unlabeled carbon and that resynthesized from fragments of the original labeled glucose. From these studies, it was estimated that the average human breaks down and synthesizes about 10 grams of glucose per hour, of which about 20% comes from "recycling" of original glucose fragments.

The action of insulin in lowering blood glucose was deduced from changes observed in the rate of decline in radioactivity. Immediately after injection, insulin invariably caused a decrease in the rate of drop; a "plateauing" of radioactivity, which corresponded closely in time with the period of fall in blood glucose. These results demonstrated that less glucose was entering the blood after insulin injection, and thus established an immediate suppressive action of insulin on glucose release. These findings suggest that a primary defect of the diabetic state is an inability to control glucose release by the liver. Dr. Weinhouse and his group are attempting to "pinpoint" the site of insulin action among the large number of enzymes involved in this process of "gluconeogenesis."

In the meantime, another action of insulin on the liver was uncovered by Dr. Weinhouse and his colleagues, with the discovery in rat liver of an unusual new enzyme involved in glucose utilization. The first biochemical step in glucose metabolism is its conversion to glucose-6-phosphate. Guided by previous observations which showed that glucose uptake occurred in liver only when the blood glucose level was high (otherwise the liver produces and releases glucose) and that the utilization of glucose by liver was impaired in diabetic animals, a glucose phosphorylating enzyme was found in liver that differs strikingly from other similar enzymes hitherto discovered, in that it functioned only at high glucose concentrations and required insulin for its full activity. Insulin was shown to stimulate synthesis of the enzyme protein. Studies of the properties of this enzyme, and the changes in its activity during insulin lack or abundance, and in other hormonal conditions, indicate that it plays an important regulatory role in glucose utilization by liver.

Thus, insulin exerts varied effects on glucose metabolism, but all are directed to maintain the blood glucose at a constant intermediate level, to increase its production when intake is low and to cause its increased utilization when intake is high. The sites and mechanisms of these diverse actions are still unknown.

CHEMICAL SAFETY NEWSLETTER

REPORT ON THE SECOND ANNUAL NEW MEXICO CHEMICAL SAFETY SYMPOSIUM FOR HIGH SCHOOL STUDENTS

On October 9, 1966, 293 New Mexico high school students spent most of their Saturday at a symposium on chemical safety, expertly arranged by the Central New Mexico Section, ACS, and held at Del Norte High School in Albuquerque. Also in attendance were several dozen high school teachers and nurses, plus a number of school officials and other observers. The program was fully as successful as the first one held a year earlier. As an indicator of its success, the Central New Mexico Section has been asked by state education officials to repeat the symposium in 1967, if at all possible. Further, it seems more than likely the Section will be asked to continue the series on an annual basis indefinitely thereafter.

The program began with a keynote address to all attendees, which I gave on the subject of "The Dangerous 'A' Student" (see *Chemistry* for February, 1965). The students then separated into two groups. One group spent the rest of the morning in the auditorium (except for a coke break), where there was a program of alternating lectures and movies. The other group went to the laboratory wing of the school, where there were a number of demonstrations in progress, each about 15 minutes long. The students saw all of the demonstrations by moving from room to room on a pre-arranged rotating schedule. After lunch, which was served in the school cafeteria, the two groups switched places, one going to the auditorium and the other to the laboratory wing.

The reception of the program by the students was excellent. The opportunity to hear scientists talking about and demonstrating their laboratory interests was obviously appreciated. Without question, the students learned as much about what interests chemists as they did about chemical safety. I believe they were impressed by the sincerity with which the speakers approached the problem of avoiding accidents.

Wasn't this all a great deal of work? Section members and teachers certainly put in some effort in assembling the symposium. Yet, no one seemed to feel he was overworked. Much credit goes to Professor Lee Hansen of the University of New Mexico and L. M. Jircinovic, Safety Department Manager at the Sandia Corporation, who served as co-chairmen. The symposium had received the enthusiastic support of Section Chairman Adam Schuch (Los Alamos). The talks and presentations were made by ACS members from local industry and the several New Mexico universities, with occasional help from specialists who were not ACS members. The entire effort could serve as a model for other local sections who are thinking about ways of giving assistance to high schools and their chemistry students.

After the 1965 symposium, Central New Mexico received dozens of letters from chemists in the U. S. and abroad asking for more information. In an attempt to ease the burden on the Section, it is suggested that ACS members or other sections who would like to know more about the 1965 and 1966 symposia might write instead to the

COMMITTEE ON CHEMICAL SAFETY
(Attn: Mr. D. A. H. Roethel)
American Chemical Society
1155 Sixteenth Street, N.W.
Washington, D. C. 20036

Mr. Roethel serves as staff liaison to our committee.

H. K. Livingston
Chairman, ACS Council's
Committee on Chemical Safety

ACS SHORT COURSES

The Second Middle Atlantic Regional Meeting will be held in New York City on February 6-7, 1967. The details were published in the October issue of *The Chesapeake Chemist*. It has been further announced that ACS Short Courses will be presented on Electron Spin Resonance and Conformational Analysis just prior to this meeting.

ELECTRON SPIN RESONANCE:

Date:	Feb. 3-5, 1967
Place:	Columbia University
Instructors:	Dr. John E. Wertz, University of Minnesota Dr. James R. Bolton, University of Minnesota
Requirements:	No textbook is required, although advance reading will be suggested. Every registrant will receive a set of lecture notes and reprints.

CONFORMATIONAL ANALYSIS:

Date:	Feb. 4-5, 1967
Place:	Columbia University
Instructors:	Dr. Norman L. Allinger, Wayne State University Dr. Ernest L. Eliel, Notre Dame University Dr. Leon H. Zalkow, Georgia Institute of Technology
Requirements:	*Conformational Analysis* by Eliel, Allinger, Angyal, and Morrison (1965). Student set of Framework Molecular Models available from Prentice-Hall, Inc., Englewood Cliffs, N. J. (or Dreiding Models).

For additional details write to the address below. There is no deadline for these courses. Registrations will be accepted until course capacity is reached. Those who require employer's authorization should register but withhold payment. Cancellations can be made up to January 20. No refunds will be made after that date. The course is open to all. ACS membership is not required.

Education Office
American Chemical Society
1155 Sixteenth Street, N.W.
Washington, D.C. 20036

Name ....

Address .... City .... State ....

Please send information on courses in

Electron Spin Resonance ....

Conformational Analysis ....

Please enroll me in Electron Spin Resonance (Reg. Fee $50) ....

Please enroll me in Conformational Analysis

A) Registration Fee $35 (Text and Models Not Included) ....

B) Registration Fee $40 (Models only) ....

C) Registration Fee $50 (Text only) ....

D) Registration Fee $55 (Includes Text and Models) ....

Chesapeake Chemist

MARYLAND SECTION NEWS

ACADEMIC

THE JOHNS HOPKINS UNIVERSITY

Professor R. G. Parr has become a member of the Advisory Editorial Boards of *Chemical Physics Letters* and the *International Journal of Quantum Chemistry*. Several faculty members of the chemistry department presented lectures at various institutions in the U. S. **Dr. Alsoph Corwin** spoke at Goucher College on October 27 on "Hemoglobin and Chlorophyll", **Dr. Emil H. White** at Duquesne University on November 4 on "The Deamination of Aliphatic Amines", **Dr. J. D. H. Donnay** at New Mexico University on November 11 on "Generalized Symmetry", and **Dr. R. G. Parr** at the University of Pennsylvania on November 16 on "Theory of Barriers to Internal Rotation about Single Bonds". **Dr. Paul H. Emmett** is presenting a series of lectures on catalysis at the University of California at Santa Barbara during November and December. **Dr. J. D. H. Donnay** attended the annual meeting of the Geological Society of America, and affiliated societies in November in San Francisco. One of his students, **Mr. Randolph Barton, Jr.** gave a paper, jointly with **Dr. Gabrielle Donnay**, on "The Absolute Orientation of Tourmaline by Anomalous Dispersion of X-rays".

HOOD COLLEGE

Hood College has received a $8,110 grant from the National Science Foundation to conduct an experimental program in computer science, in cooperation with the National Bureau of Standards in Gaithersburg. St. Joseph College and Mount Saint Agnes College will also participate in this pilot project, the first of its kind in the Baltimore-Washington area. Hood College will administer the grant.

Dr. Phyllida M. Willis, professor of chemistry at Hood College, will direct the program, which consists of the academic year course, "Introduction to Computer Science", followed by a ten-week summer apprenticeship session. The course, which began in late September, is being taught by personnel from the National Bureau of Standards. Other college professors are participating in the work.

One purpose of the program is to introduce students at liberal arts colleges to the potential supporting role of computers in both natural and social sciences. It will involve students with a wide variety of major fields of interest, and is open to all juniors. The summer apprenticeship will be open to six students who will be chosen within the first few weeks of the course.

The three colleges participating this year are all within close proximity to Gaithersburg, but it is planned that in subsequent years more colleges will be able to participate by means of teletype equipment and a time-sharing arrangement.

ONLY THE NAME HAS BEEN CHANGED . . .

After a year of soul searching, the Committee on Professional Relations and Status has won approval from the Council to drop the "and Status" from its name. Principally, the Committee felt the word "Status" implied that chemists and chemical engineers were still seeking identification as professionals when, in fact, such august bodies as the U. S. Supreme Court and the Congress had conferred professional standing on them long ago. The self-seeking implications of the word also bothered the Committee.

(*Continued from page 12*)

GOVERNMENT

BUREAU OF CUSTOMS

Judith Zeffert, presently a senior chemistry major at Goucher College, was a physical science aid at the United States Customs Laboratory this summer where she did research with **Mr. Melvin Lerner**, Chief Chemist, on the trans isomers of tetrahydrocannibinol, the physiologically-active component of marihuana and hashish. A report of this work is presently being submitted for publication. (The position was obtained through the U. S. Civil Service Commission Test for Summer Jobs.)

FORT DETRICK

The Frederick Chapter of the Maryland Society of Professional Engineers presented a program of vital interest to citizens of Frederick at their meeting at the Officers' Open Mess on October 12. The program moderator, **Dr. Riley Kinman** discussed "New Water From Old", illustrating his talk with color slides and relating humerous incidents. Dr. Kinman is Assistant Chief of Demonstration Grants Branch in the Division of Research and Training Grants at the newly-formed Water Pollution Control Commission of the Department of the Interior.

ONLY THE NAME HAS BEEN CHANGED

(*Continued from page 12*)

In asking for a name change to "Committee on Professional Relations", Chairman Joseph Stewart emphasized that neither the range of the Committee's programs nor its concern with matters relating to the professional status of chemical scientists would be diminished. The new title will become effective January 1, 1967, contingent upon confirmation by the Board of Directors at its meeting in December.

From *PR CATALYST*

DR. JOHN JOSEPH EISCH

Born in Milwaukee, Wisconsin, John Joseph Eisch received his undergraduate education at Marquette University (B.S. in chemistry, 1952, *summa cum laude*) and his doctorate in organic chemistry from Iowa State University (1956). As postdoctoral fellow he studied with Professor Karl Ziegler at the Max Planck Institut für Kohlenforschung, Mulheim, Germany (1956-1957). He taught at St. Louis University of Michigan (1957-1963). In 1963, he joined the Department of Chemistry of the Catholic University of America where he is presently Acting Head. His research interests lie in the areas of organometallic and heterocylic chemistry, with emphasis on the behavior of unsaturation proximate to electron-deficient functional groups. Besides having published some fifty research papers he has written a correlative monograph on organometallic chemistry. In addition, he is co-author with R. B. King of the series, "Organometallic Synthesis".

DR. SIDNEY WEINHOUSE

Dr. Sidney Weinhouse received the B.S. and Ph.D. degrees at the University of Chicago, having worked on reactions of metalloorganic compounds with the late Professor M. S. Kharash. As a postdoctoral fellow at the University of Chicago he began work on the field of lipid metabolism as related to arteriosclerosis.

After working with the Office of Scientific Research and Development during the war, he joined the Houdry Process Corporation. In collaboration with Dr. A. V. Grosse and company engineers, Dr. Weinhouse built and operated a thermal diffusion unit for production of the stable isotope, carbon 13. In collaboration with members of the Lankenau Hospital Research Institute he utilized this material for studies of the metabolism of fatty acids, carbohydrates and amino acids, and in 1950 joined the Institute for Cancer Research in Philadelphia. As a member of the staff of this institution, he continued research in the field of intermediary metabolism and extended his studies to the field of cancer. In 1961, Dr. Weinhouse moved to Temple University Medical School as Associate Director, and in 1963 was appointed Director of the Fels Research Institute. He is also a Professor of Biochemistry at that institution. Graduate training has occupied an important aspect of his research, and he has trained a large number of predoctoral and postdoctoral students.

In addition to research and teaching, he has been engaged in several editorial activities including membership on the editorial boards of the *Journal of Biological Chemistry, Archives of Biochemistry and Biophysics*, and *Cancer Research*, and is a co-editor with Sir Alexander Haddow of the *Advances in Cancer Research.*

Dr. Weinhouse has served on advisory panels dealing with the allocation of research funds in biomedical fields, has been a member of the Biochemistry Study Section and the National Advisory Cancer Council of the National Institutes of Health and is currently a member of the Cancer Advisory Committee of the Damon Runyon Memorial Fund for Cancer Research.

He has also served on many local and national committees of the American Chemical Society, is a past Chairman of the Biological Division and a former member of the Board of Directors of the Philadelphia Section. In 1965 he was recipient of the Philadelphia Section Award.

ORGANOMETALLICS

The pioneering research of Ziegler and co-workers has demonstrated that unsolvated aluminum alkyls and alkylaluminum hydrides add to unsaturated hydrocarbons with unexpected ease. Since such additions can be viewed as processes proceeding via intermolecular Lewis base (—C≡C—)—Lewis acid (R_3Al) interactions, it seemed appealing to study the synthesis and the behavior of unsaturated organoalumium compounds. In these systems the possibility of intramolecular Lewis acid-base interactions would be expected to give rise to an intriguing array of chemical and physical properties.

The present study reports the chemical consequences of proximate unsaturation in compounds of the type, $R_2Al—(C)_n—C{\equiv}C—R'$(I). By varying the nature of the substituents (R and R′) and the value of n this test system would become a vinylic, acetylenic, aryl, allylic or homoallylic aluminum system. In order to synthesize the desired organoaluminum compounds, an extensive study has been made of the interaction of organoaluminum compounds with alkynes and dienes.

Subsequent examination of the resulting unsaturated aluminum compounds (I) has uncovered the following novel transformations: (a) the cyclization of certain aluminum aryls to yield aluminum heterocycles (aluminoles, aluminepins and aluminazarophenanthrenes); (b) the isomerization of 1-alkenylaluminum compounds; (c) the carbocyclization of cycloalkenylaluminum systems; (d) the facile metallation of certain hydrocarbons by aluminum aryls; and (e) the rearrangement equilibria in allylic aluminum systems. The foregoing observations have been extended by kinetic and isomer ratio studies, in order to gain insight into the nature of the carbon-aluminum bond and the mechanisms of organoaluminum reactions.

MEMBERSHIP CHANGES

TRANSFERRED IN

Kane, Vinayak V., Chem. Dept., The Johns Hopkins University, Baltimore, Md. 21218

Kask, Uno, Towson State College, Towson, Md. 21204

Kutsky, Roman J., V. A. Hospital, 3900 Loch Raven Blvd., Baltimore, Md. 21218

Liebman, Arnold A., Sch. Pharm., Univ. Md., Baltimore, Md. 21201

Matsuo, Kohtard, Chem. Dept., The Johns Hopkins Univ., Baltimore, Md. 21218

Maurey, John R., 1214 Taney Ave., Frederick, Md. 21701

Meadow, Norman D., 980 Radcliffe Rd., Towson, Md. 21204

Nash, E. Garrett, Chem. Dept., The Johns Hopkins Univ., Baltimore, Md. 21218

Nees, Monica, Univ. Md., 5401 Wilkins Ave., Baltimore, Md. 21228

Pastine, Barbara A., Brooks Rd., Highland, Md. 20729

Ridgway, Raymond A., Bel Air, Md. 21014

Sain, Mark H., 10330 Malcolm Cir., Cockeysville, Md. 21030

Scherzer, Julius, 1905 N. Forest Pk. Ave., Apt. S5, Baltimore, Md. 21207

Snyder, Henry Moore, Jr., Standard Lime and Refs. Co., 2000 1st National Bank Bldg., Baltimore, Md. 21202

Stempel, Lloyd M., 5202 Loch Raven Blvd., Baltimore, Md. 21212

Suydam, Coe D., Jr., Goucher College, Towson, Md. 21204

Sweeney, Charles John, 8405 Tallwood Rd., Lutherville, Md. 21093

Wheeler, Edward S., 209 Severn River Rd., Round Bay, Severna Park, Md. 21146

NATIONAL ORGANIC SYMPOSIUM

The ACS Division of Organic Chemistry will hold its 20th National Organic Symposium on the campus of the University of Vermont, Burlington, Vermont from June 19 to June 22, 1967. This is the major symposium of the Division and is designed to inform chemists about newer methods and results in organic chemistry. The Symposium will feature the Roger Adams Award address by **John D. Roberts** and will include talks by **F. A. L. Anet, M. L. Bender, O. L. Chapman, G. L. Closs, G. S. Hammond, H. O. House, R. Pettit, P. R. Schleyer, H. E. Simmons,** and **R. B. Woodward.**

Pre-registration is required for attendance at this meeting. Forms will be mailed to the members of the Organic Division at the time of the spring mailing. Further information and a registration form will be published in an April issue of *Chemical and Engineering News.*

ACADEMIC OPENINGS

The fall edition of "Academic Openings" was published in late November. Some 2000 colleges, universities, junior colleges, and research institutes in the U. S. and Canada have been invited to list their academic and postdoctoral openings in chemistry, biochemistry, and chemical engineering. Such invitations have been sent out three times a year in the past, once each for the three editions published a year. This year the one invitation will serve the fall, winter, and spring issues.

Copies of the fall issue will be sent to each four-year college and university department of chemistry, biochemistry, and chemical engineering in the U. S. and to 53 institutions in Canada: to ACS local section chairmen and secretaries. "Academic Openings" will be sent to junior college departments on request. Single copies are available on request from the ACS Educational Secretary at the Society headquarters in Washington, D. C.

MEN AND MOLECULES

"Men and Molecules", the American Chemical Society's highly successful science documentary series produced for radio, has a new producer. **Norman Metzger,** a staff writer for the ACS News Service since 1962, will be in charge, replacing **John Henahan,** who is taking a leave of absence. Mr. Henahan initiated the show in 1961 and has produced it since that time.

Mr. Metzger, a graduate of Brooklyn College, was a chemist with the Sloan-Kettering Institute of Cancer Research for a year (1960-61) and then attended Rensselaer Polytechnic Institute, where he received the M.S. in technical writing in 1962.

At the last count "Men and Molecules" was being broadcast on about 325 stations in the U. S. and approximately 240 overseas outlets, including the Armed Forces Radio and Television Service and the Voice of America.

SECTION OFFICERS FOR 1967

The 1967 Chairman of the Maryland Section of the American Chemical Society is **Dr. William H. Stahl** of the Research and Development Laboratories of McCormick and Co., Inc. at Cockeysville. Serving with Dr. Stahl will be **F. Timothy Parr** as Chairman-elect, **Richard Kokes** as Secretary, **Thomas Simmons** as Treasurer, **F. Marion Miller** and **G. Steinberg** as Councilors, **James Leslie** and **Rudolph J. Allgeier** as Alternate Councilors, and **Harold Delaney, Bernard M. Zeffert, Donald E. Jones, J. Goldenson,** and **Alex Nikon** as Members-at-large. With the exception of Dr. Stahl all these officers were elected at the meeting on Novmber 16.

COPY DEADLINE

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

IMPORTANT NOTICE

The date of the December Meeting has been changed from the 14th to the 21st.

---------- Tear-Out Dinner Reservation Form ----------

There is enclosed $____________($3.50 per person)* for cocktails and dinner at Eudowood Caterers, Eudowood Plaza, on Wednesday, December 21, 1966 for the following persons.**

Name (Please Print or Typewrite.) Affiliation

____________________ ____________________

____________________ ____________________

*Please make checks payable to Maryland Section, ACS and mail together with reservation form to **Mr. Allen Bednarczyk,** McCormick and Co., Inc., Box 21, Cockeysville, Md. 21030, or phone 666-3155.

**Return by December 17. Please be prompt.

The Chesapeake Chemist
University of Maryland
636 W. Lombard Street
Baltimore, Maryland 21201

Nonprofit Org.
U.S. Postage
PAID
Baltimore, Md.
Permit No. 2917

PLEASE DO NOT DELAY — DATED NOTICE INSIDE