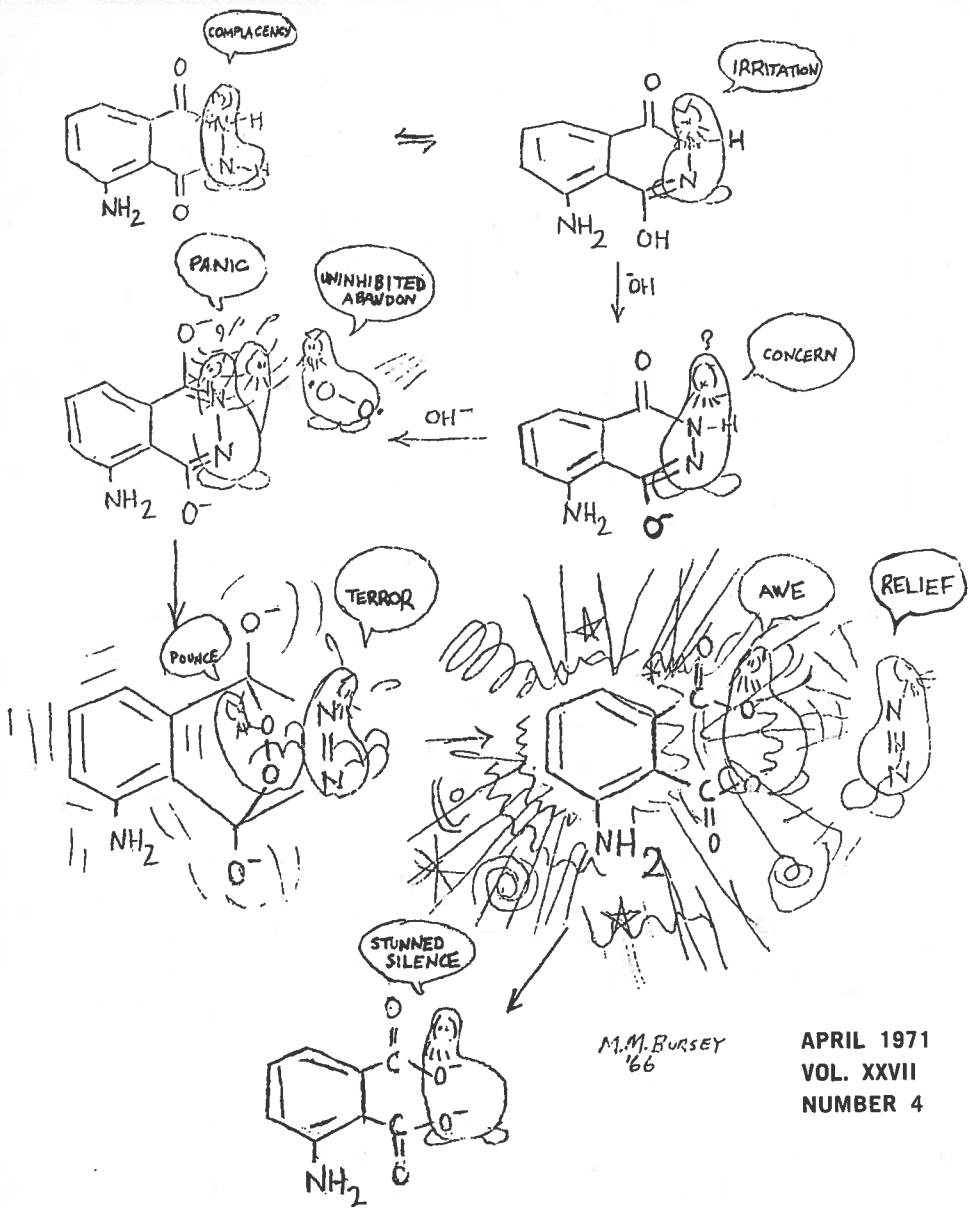




THE CHESAPEAKE CHEMIST

MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY



APRIL 1971
VOL. XXVII
NUMBER 4

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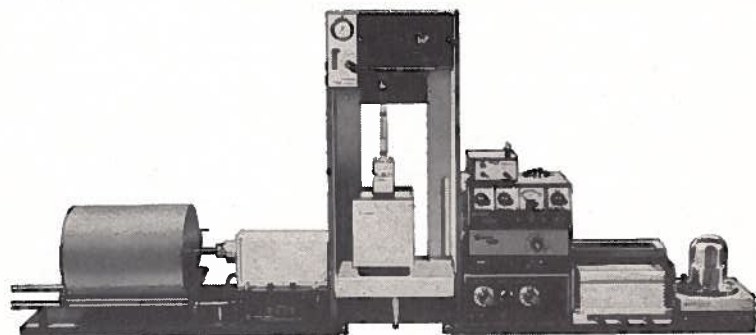
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S-963

APRIL MEETING

NEW ASPECTS OF CHEMISTRY

DATE:

WEDNESDAY, APRIL 21, 1971.

PLACE:

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

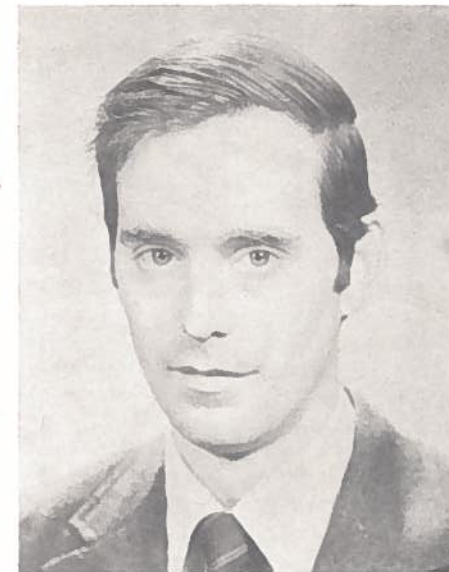
SPEAKERS AND TOPICS:

5:30 P.M. Dr. Edward Arnett, Univ. of Pittsburgh, "Proton Transfer Equilibrium Constants".

8:30 P.M. Dr. David F. Roswell, Loyola College, "Chemiluminescent Reactions in Solution".

SOCIAL HOUR:

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



DAVID F. ROSWELL

COCKTAILS AND DINNER:

Eudowood Gardens Dining Room. Price is \$4.75 per person for cocktails (6:30-7:15, unlimited quantity) and hot buffet dinner (7:15). Students and their spouses may attend the dinner for \$3.00. Reservations are necessary for the dinner, and should be made with Mr. Allen Bednarczyk, McCormick and Co., Inc., 204 Wight Avenue, Cockeysville, Md. 21030, phone 666-3155, no later than April 16. 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 wife and friends to both the dinner and the meeting.



EDWARD ARNETT

David Stanley Dixon, is attending Catonsville Community College, in the Chemical Technology curriculum, as the result of winning a scholarship from the Maryland section of the American Chemical Society. His expenses and tuition for a two-year period are covered by the award, and he will receive the Associate in Arts degree when he completes his program.

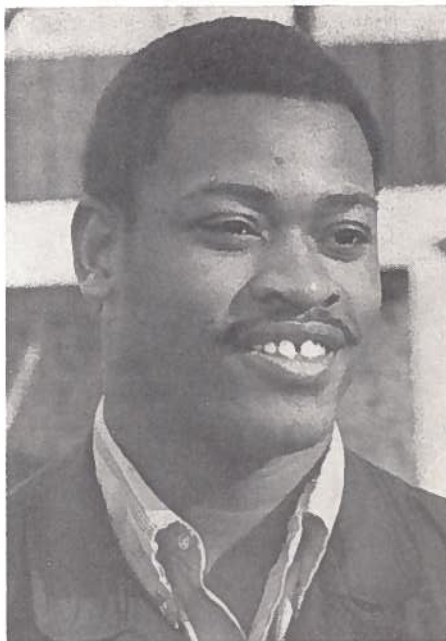
According to Joseph A. Scarlett, who directs the occupationally-oriented career programs at the community college, this is the first time this particular scholarship has been awarded. It was created by the Maryland chemists' group to assist urban youth to acquire skills leading to better jobs and to encourage these young people to consider careers in the chemical field. The association, therefore, collected funds from various sources and established the two-year scholarship. A committee to screen applicants was appointed, chaired by Dr. Ernest Silversmith, chairman of the department of chemistry of Morgan State College, and young Dixon was selected as the first recipient.

A 1970 graduate of Dunbar High School, Mr. Dixon, who is 19, reports that he especially liked high school chemistry courses and feels that this will lead him to a "rewarding career".

"I find the community college very strong," he says, "And I think I much prefer it to a four-year college. It seems to me a better preparation for life. I could go to a four-year college and maybe still not be prepared for what I want to do when I get out. I'm grateful for the scholarship, but I wouldn't want to be any place else".

Mr. Dixon is interested in athletics and sports, particularly baseball and football, but reports that he isn't planning to "go out for the team unless I feel I am really doing well in my studies". He also likes building model cars and feels he might one day consider learning something about automobile mechanics as a second field.

About his future in a chemical career, young Dixon says that he isn't really



DAVID DIXON

sure whether he will seek immediate employment upon graduation from the community college or will think about going on for a bachelor's degree. Many of the subjects he is taking would be transferable to a senior college or university, or he will be prepared with basic skills for employment as a research assistant, laboratory analyst, chemical production technician or pilot plant technician.

The Chemical Technology program at the community college was begun several years ago, Mr. Scarlett reports, as the result of interest by the industry in programs which would train much-needed manpower. It offers courses in qualitative and quantitative analysis, organic chemistry, physics, chemical laboratory techniques, technical mathematics, and technical writing, as well as general academic subjects for a well-rounded education. A co-operative work-study program with local industry, which provides alternating semesters of study and actual work experience, is also available for those who qualify, Mr. Scarlett concluded.

MARYLAND SECTION NEWS

Essex Community College

Dr. Marvin J. Albinak was promoted to professor of Chemistry.

UNIV. OF MARYLAND

Dr. John P. Lambooy has been named Dean of Graduate Studies and Research. He also holds an appointment as Professor of Biochemistry in the Medical School's Department of Biological Chemistry.

JHU

Professor Alsoph H. Corwin presented a lecture entitled "Taxonomy" at the Society for Clinical Ecology, Chicago, Ill.

Dr. A. Nickon has been awarded a NSF Senior Postdoctoral Fellowship. He will use the fellowship for a year's sabbatical study at the University of Munich.

Professor Richard J. Kokes received the first Paul H. Emmett Award in fundamental catalysis at the national meeting of the Catalysis Society in Houston, Texas. The award is sponsored by the Davision Chemical Division of W. R. Grace and Company.

Professor J. D. H. Donnay presented an invited lecture entitled "Cross-twinning, a Mechanism of Phase Transition" at a meeting of the American Crystallographic Association, Columbia, South Carolina.

LOYOLA COLLEGE

Dr. Melvin P. Miller, Professor of Chemistry at Loyola College, Baltimore, has been awarded a National Science Foundation grant which will permit him to engage in thirteen months of independent study and research in Physical Chemistry and Environmental Engineering at The Johns Hopkins University. Dr. Miller will be collaborating with Professors Richard Kokes and Jerome Gavis at Hopkins, and will also act as a faculty consultant to students in the physical chemistry laboratory.

Fort Detrick

Thomas R. Dashiell, who has been at Fort Detrick for 19 years and was formally the Assistant Scientific Director for Development & Engineering, has assumed a new position at the Pentagon. During a brief farewell ceremony, Colonel F. B. Mitman, Jr., Commanding Officer of Fort Detrick, presented Mr. Dashiell with the Dept. of the Army Special Service Award.

ACS SHORT COURSES HETEROGENOUS CATALYSIS

June 4-5—Pittsburgh, Pa. Dr. Robert L. Burwell, Jr., and Dr. Michel Boudart; fee \$85; sponsor, Pittsburgh Section.

This course will present the current state of our understanding of the how and why of heterogeneous catalytic processes. It will treat the descriptive and theoretical aspects of chemisorption which apply to heterogeneous catalysis, the texture of catalysts, the nature of sites on the surfaces of catalysts which lead to catalysis, and the electronic theory of binding to them. Kinetics and other techniques which assist in diagnosing mechanisms, in particular, structure variation, isotopic tracers, stereochemistry, and poisoning, will be discussed.

MODERN LIQUID CHROMATOGRAPHY

June 4-5—Chicago, Ill. Dr. Lloyd R. Snyder and Dr. J. J. Kirkland; fee \$95, including lunches; sponsor, Chicago Section.

This new course provides a basic introduction to the principles and practice of modern—high speed, high efficiency—liquid chromatography. No background in chromatography is assumed. Theory, applications, equipment, and techniques are covered for each of the important areas of modern LC: liquid-liquid (partition), liquid-solid (adsorption), ion exchange, gel permeation, gel filtration. Emphasis throughout is on practical aspects.

DR. EDWARD ARNETT

Edward Arnett was born on September 25, 1922 in Philadelphia, Pennsylvania. His undergraduate and graduate training in chemistry was obtained at the University of Pennsylvania where he received his B. S. in 1943, his M. S. in 1946, and his Ph.D. in 1949. His last year in graduate school was spent as a du Pont Fellow.

After receiving his doctorate, Dr. Arnett spent four years as Research Director of the Max Levy Company. In 1953, Dr. Arnett moved to the academic world, accepting the position of Assistant Professor at Western Maryland College. The years 1955-1957 were spent as a Research Fellow with Professor P. D. Bartlett at Harvard University. He began his tenure at the University of Pittsburgh in 1957 and was promoted to Professor in 1964. Dr. Arnett was visiting Professor at the University of Colorado (Summer, 1965) and the University of New Hampshire (Summer, 1966). He was also Distinguished Lecturer at Howard University (1966) and visiting Professor at the University of Kent, Canterbury, Kent, England (1970). Dr. Arnett was a Guggenheim Fellow, 1968-1969. Besides his position at the University of Pittsburgh, Dr. Arnett has served as Adjunct Senior Fellow of Mellon Institute since 1964, Director of the Pittsburgh Chemical Information Center since 1968, and member of the Petroleum Research Fund Advisory Board since 1968. In 1969, he began serving on the National Research Council Committee on Chemical Information and has recently been appointed to the Editorial Advisory Board of the Institute for Scientific Information.

IF YOU CHANGE YOUR ADDRESS . . . Please do not notify the Editor of the *Chesapeake Chemist*, but send your new and old addresses to: The American Chemical Society, 1155 Sixteenth Street, N.W., Washington, D. C. 20036. The Maryland Section will then be notified.

Dr. Arnett is a member of the American Chemical Society, the Chemical Society (London), Sigma Xi, A.A.A.S., and Phi Lambda Upsilon. His principle areas of research have been in solvent effects in organic chemistry, acid-base equilibria and acidity functions, crowded benzene systems, and chemical information systems.

PROTON TRANSFER EQUILIBRIUM CONSTANTS

All organic compounds can engage in proton transfer either as acids, bases or both. Furthermore, acid base catalysis is the most common means of activating organic molecules for reaction. Unfortunately, there are very few classes of organic compounds for which proton transfer equilibrium constants are known with accuracy when referred to a common standard state. The talk will explore the scope and reasons for this problem and a number of experimental approaches toward its solution.

DR. DAVID F. ROSWELL

David F. Roswell was born in Indiana on December 5, 1942. His introduction to chemistry began early in life since his father is a research chemist and his grandfather was a chemical engineer. He received his high school education both at Mount Saint Joseph's High School in Baltimore and Kloster Schaftlarn outside of Munich, West Germany. After entering the Johns Hopkins University as a chemistry major he began to do undergraduate research in the field of chemiluminescence under the direction of Professor Emil White. During his tenure as an undergraduate he spent two summers with Professor White as a National Science Foundation Undergraduate Research Participant.

In 1964 he received his AB degree and was accepted as a graduate student in the Department of Chemistry at Johns Hopkins. As a graduate student he held a Remsen Memorial Scholarship, a Gilman Fellowship and a Whitco Chemical Company Fellowship. He spent one summer at the W. R. Grace Research Center

(Continued on page 9)

DR. DAVID F. ROSWELL

(Continued from page 8)

in Clarksville. During his final years as a graduate student he taught part time at the College of Notre Dame of Maryland. He received his Ph.D. in 1968 from Johns Hopkins under Professor White.

Since 1968 Dr. Roswell has been at Loyola College of Baltimore. He currently holds the rank of Assistant Professor in the Department of Chemistry. He is also a faculty member in the evening college at Johns Hopkins and still collaborates with Professor White and his group in the area of chemiluminescence. He is a co-author with Professor White of a number of papers in that area.

CHEMILUMINESCENT REACTIONS IN SOLUTION

In the last two centuries a number of reactions have been reported to produce strong visual luminescence. This luminescence, called chemiluminescence, is in excess of blackbody emission. Chemiluminescence occurs when the reaction produces an electronically excited state which on return to its ground state emits a photon. One method of classifying these reactions is by quantum yield (QY): strong (QY 10^{-3} or greater), moderate (QY 10^{-2} - 10^{-3}), and weak (QY 10^{-5} - 10^{-2} i.e., not visible to the naked eye). Another means of differentiation is to classify them according to type: (1) reactions in which oxygen is involved, (2) oxidation-reduction reactions not involving oxygen, and (3) decomposition reactions of thermally unstable intermediates or starting materials. These types can be even further subdivided; in some the emitter is a product of the reaction (direct chemiluminescence) and in others the emitter is another species to which the product's excess electronic energy has been transferred (sensitized chemiluminescence).

One of the simpler strongly chemiluminescent systems of type 1 is the reaction of alkaline hydrogen peroxide with chlorine gas. Detailed studies of the resulting red emission has estab-

lished that the decay of chemically produced metastable single and double states of oxygen to the ground state is responsible for the emission. The emission can be wavelength shifted and the quantum yield increased by the addition of suitable acceptor molecules. This results in sensitized chemiluminescence.

Examples of direct chemiluminescence of type 2 are the annihilation reaction between positive and negative aromatic hydrocarbon radical ions produced by alternating current and the reaction of radical anions with oxidants.

The recently reported thermal decompositions of dioxetanes in the presence of fluorescent acceptors is a sensitized chemiluminescent reaction of type 3. Another example of this type is the reaction of oxalate esters with hydrogen peroxide in the presence of acceptors like rubrene.

The strong chemiluminescent reaction involving the alkaline oxidation of luminol (3-amino phthalic hydrazide) has been widely studied. Early work involved dealt mainly with changes in structural features and their effect on increasing or decreasing the chemiluminescence. In the last fifteen years the stoichiometry, kinetics and the emitter have been determined. Working with luminol and other appropriate hydrazides has lead to a variety of proposals as to the mechanism of the reaction. These proposals have suggested the involvement of a variety of intermediates.

An introduction to the field of chemiluminescence will be given along with details on a number of types of reactions. The present status of luminol chemiluminescence will be discussed.

MAY 19th MEETING REMSEN MEMORIAL LECTURE

COPY DEADLINE

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

EMPLOYMENT SERVICE

Prospective employers: If you are interested in learning more about any of the persons listed, please contact the Editor, Chesapeake Chemist.

He will notify the applicants to contact you for an interview, or to send a resumé according to your preference.

Applicants notified by the Editor of an inquiry have the option of making the contact requested or not as they see fit. Once a contact has been made, negotiations take place directly between applicant and prospective employer without further intervention by the Editor.

There is no charge made for this service, nor does the Editor assume any obligations for the accuracy of the information supplied by the applicants. Ads will run 2 months unless otherwise notified. Applicants should submit a short paragraph indicating data to be published including type of job wanted, location, asking salary, etc.

037101—Male, *Molecular Luminescence Specialist*, Ph.D., 3 years postdoctoral experience, publications. Background in Physics and Physical Chemistry. Seeks industrial or teaching position.

037102—Male, *Analytical/Mass Spec.*, Ph.D., recent graduate with thesis in chemical ionization mass spec., also experience in pharmaceutical analysis. Meetings & publications.

037103—Male, *Paint Chemist*, M.S., 20 years experience in formulation, R&D, extensive laboratory supervision, technical sales service. Fluent in German & French. Active in local professional organizations. Present position abolished.

037104—Male, *Pigment Chemist*, B.S., 1 year's experience in color development, formulation and plant production. Taught Science one semester in Junior High.

COVER

Proposed mechanism for luminol reaction as drawn by M. M. Bursey while a graduate student at J.H.U.

EASTERN ANALYTICAL SYMPOSIUM

The Eastern Analytical Symposium will be held November 10-12, 1971, at the Statler-Hilton Hotel in New York City.

In order to broaden the scope of the symposium in the sense of including the very latest developments in the field of Analytical Chemistry and Spectroscopy, it has been decided that the EAS will include in its next program (November, 1971) a maximum of three half-day sessions of submitted papers. Each speaker will be allowed 30 minutes for his presentation; 25 minutes for the talk and 5 minutes for questions and answers. All those interested in presenting papers at this meeting, should send four copies of a 300 word abstract to: A. Z. Conner, Hercules, Inc., Research Center, Wilmington, Delaware, 19899.

In order for abstracts to be revised for consideration, they must be received before May 1, 1971.

The symposium officers are:

General Chairman—Ivor L. Simmons, M&T Chemicals Inc., Rahway, N. J. 07065

Program Chairman—A. Z. Conner, Hercules, Inc., Research Center, Wilmington, Del. 19899

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Exposition Chairman—Anthony Clemente, Geigy Chemical Co., Ardsley, N. Y. 10502

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For additional information, concerning the symposium, please contact the publicity chairman.

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THE CHESAPEAKE CHEMIST

WELCOME...

The following people have recently joined the Maryland Section of the American Chemical Society. The Local Section welcomes each one and invites each member to attend Local Section meetings and to participate in Local Section activities.

Frank Block, Hornbeam Rd., Edgewood.
Mr. Daniel J. Brunelle, N. Chas. St., Baltimore.

Chang Koo Yun, J.H.U., Baltimore.
Dr. Chung-Ho Chen, Darien Rd., Baltimore.

Carroll Wayne Collier, Braddock Hgts., Md.

E. A. Coons, Pulaski Hwy., Baltimore.
Capt. Thomas C. Cunningham, Green Mt. Circle, Columbia.

Dr. John H. Daniel, Jr., Fairfield Rd., Baltimore.

Miss Helen Louise Faherty, Naturo Rd., Towson.

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Dr. Jerome Gavis, J.H.U., Baltimore.
Neal Richard Grossman, Stephanie Rd., Randallstown.

Gary Steven Johnson, Langrehr Rd., Baltimore.

Elvin R. Lukenbach, Beagle Lane, Randallstown.

John Anthony Navitski, Pleasant Oaks Rd., Baltimore.

Gary Edward Onken, Alice Ave., Ellicott City.

Carl L. Schaller, Pocono Dr., Arnold.
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Paul Vincent Sneeringer, Kentucky Ave., Baltimore.

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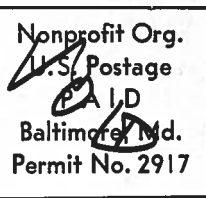
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Name (Please Print or Typewrite.) Affiliation

*Please make checks payable to Maryland Section, ACS and mail together with reservation form to Mr. Allen Bednarczyk, McCormick and Co., Inc., 204 Wight Ave., Cockeysville, Md. 21030, or phone 666-3155.

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