THE CHESAPEAKE CHEMIST

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SUMBA: A FALSE PANACEA FOR HIGHER EDUCATION

For the second time in five years, a proposal has been made to establish a State University of Metropolitan Baltimore (SUMBA). While the details of the current version of the proposal remains vague at this time, its salient feature is clear, namely that SUMBA would be made up of three components of the state college system (Morgan and Towson State Colleges and the University of Baltimore) and UMBC which is part of the University of Maryland system. Were the proposal to become a reality, the new university would be organized according to the so-called "magnet" theory, the various campuses being differentiated by areas of academic specialization. Presumably Towson would concentrate on education, Morgan on the social sciences, the University of Baltimore on business and law and UMBC on the physical and biological sciences. (The proposed fate of the Humanities is unknown). The need for minimally-required academic balance would be met by assigning to each campus faculty members who would provide primarily introductory courses in areas other than the one in which the campus specializes. Concommitantly, other faculty members would be shifted to campuses at which their areas of specialization are emphasized.

The proponents of this plan appear to be focusing their attention on what Dr. Calvin Lee, Chancellor of UMBC, has characterized as "nasty political and inter-personal problems." Conspicuous by its absence from their considerations is the question of the academic merit of blending established public institutions of higher learning without regard to the fundamental distinctions between them. Such distinctions appear to be self-evident in the cases of private institutions. No one would confuse the roles of Johns Hopkins University, Loyola, and Goucher Colleges. Yet, in the public sector, the corresponding distinctions are blurred by confusion about the respective functions of a university and the state colleges.

Consider for example the effect on the teaching of chemistry of removing UMBC from the University of Maryland system. Since its inception in 1966, a continuous painstaking development has proceeded at UMBC leading to the development of undergraduate programs of distinction, and most recently, a new graduate programs which complement those at other campuses of the University. These developments now make it possible for a qualified student in the Baltimore area to pursue a university-level program of study in chemistry previously available in a public Maryland institution only at the College Park campus. The essential feature of any university-level program, and the one that distinguishes it from programs in other kinds of institutions, is that students are placed in contact with a faculty active in scholarship and research. UMBC has succeeded in attracting such faculty to its Chemistry Department. This is attested to by, among other indicators, the receipt of over $500,000 in competitive research grants during the past three years alone. Similar statements apply to other departments of UMBC, Biological and Social Sciences, for example.

One major consideration in any discussion of higher education in the Baltimore Metropolitan area is the need for a diversity of *publicly* supported educational institutions. Such diversity allows the broadest possible choice of academic programs, including also programs at a university level such as are now available at UMBC. Local private institutions alone cannot meet the demand for higher education created by a population which includes students for whom equal opportunity is only now becoming a reality. Included also in this population are the sons and daughters of families for whom tuition charges at private institutions have become prohibitive. That a need exists for the state colleges and the two-year community colleges is undeniable, but the Baltimore metropolitan area also needs UMBC which is its only publicly-supported university. The incorporation of UMBC into the proposed SUMBA would result in the dispersal of its faculty and students and the dilution of its academic programs.

Fred Gornick, Prof. of Chem. UMBC

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COVER: Dr. Joyce J. Kaufman

Charcoal portrait by
Jim Wychgram

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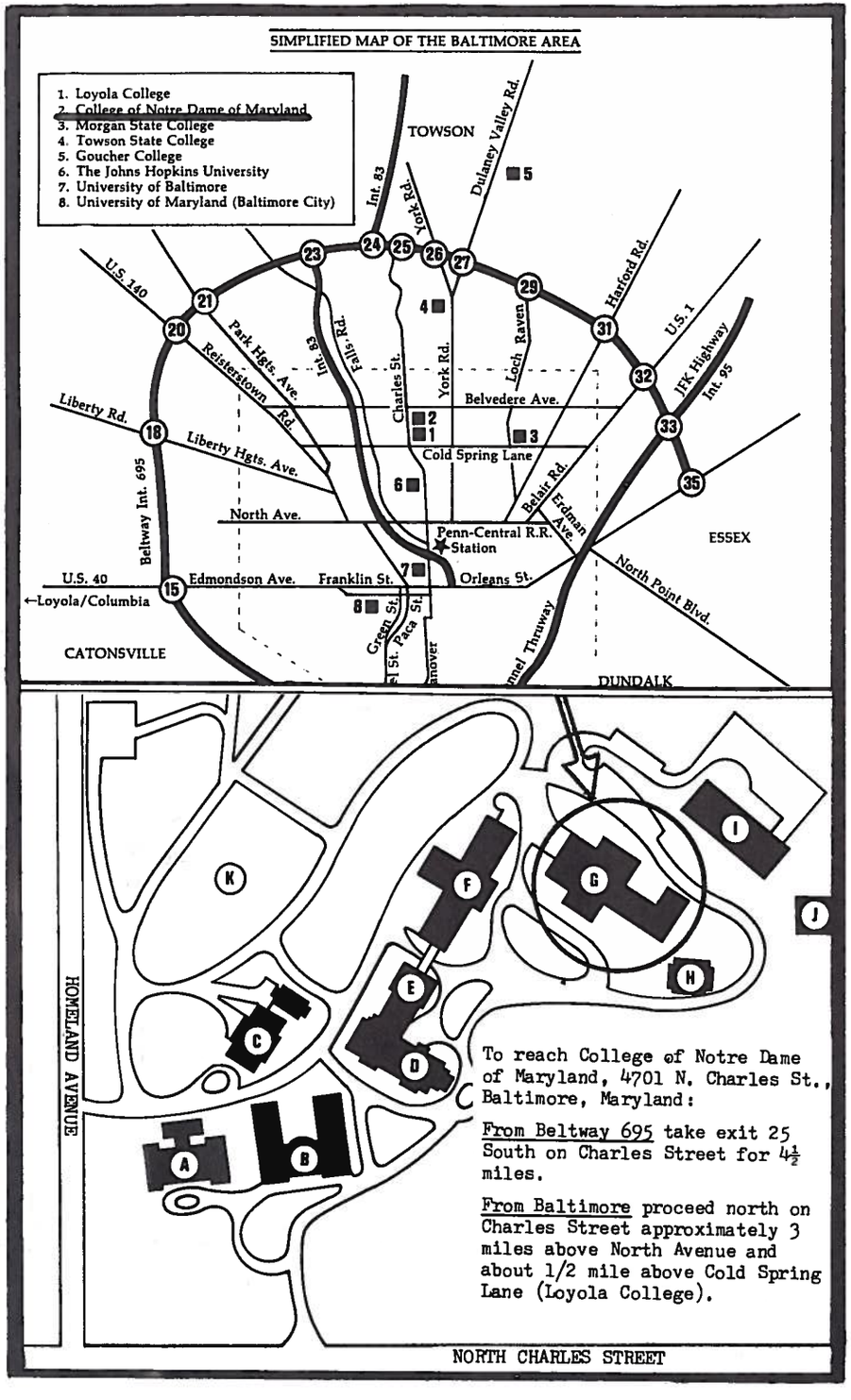

DECEMBER MEETING

DR. JOYCE J. KAUFMAN

DATE:

WEDNESDAY, DECEMBER 18, 1974

PLACE:

Knott Science Center
College of Notre Dame of Md.
4701 N. Charles Street
Baltimore
[See map on p. 4.]

SPEAKER and TOPIC:

8:30 pm

THE MARYLAND CHEMIST AWARD
Dr. Joyce J. Kaufman:
Quantum Chemistry -- From Molecular Collisions to Molecular Medicine

SOCIAL HOUR:

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

COCKTAILS and DINNER:

Doyle Building Dining Room
College of Notre Dame of Md.
Cocktails 6:30 - 7:15, courtesy of Hewlett-Packard.
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 using the form on p. 6, or phone:

Dr. Allen Bednarczyk
McCormick and Co., Inc.
667-7480, 667-7470.

It is not necessary to be a member of the ACS to attend the dinner or the talk. The talk may be attended without attending the dinner. You are invited to bring you wife or husband to both the dinner and the meeting.

Giles B. Cooke, 1897-1974

Dr. Giles B. Cooke, a world authority on cork and long an active member of the Maryland Section, died on October 13.

Dr. Cooke was a native of Gloucester, Virginia; he obtained his B.S. at the College of William and Mary, and M.S. and Ph.D. at the University of Maryland in organic chemistry.

He became a research chemist with the Armstrong Cork Company in Lancaster, Pa. and then served as director of research for the Crown Cork and Seal Company of Baltimore from 1934 to 1959. While there he acquired an international reputation for his knowledge of the properties of cork. He held 21 patents in food and beverage packaging, and was the author of *Cork and the Cork Tree*.

After his retirement from Crown Cork and Seal, Dr. Cooke joined the faculty of Essex Community College, then a small struggling junior college. As it grew, he became Chairman of the Division of Science and Mathematics, and built it up steadily. Upon his retirement in 1967, he was named an emiritus professor, and the College named the Science Building the Giles B. Cooke Laboratories in his honor.

Dr. Cooke worked long and generously for the Maryland Section, serving on the Executive Committee, as Section Chairman, as editor of The Chesapeake Chemist, and as a Councillor. While on the national Council, he was a member of the Council Standing Committee on Membership Affairs, and later a member of the Council Committee on Education.

TEAR-OUT DINNER RESERVATION FORM

Enclosed is $____($5.50 per person)* for dinner reservations at the College of Notre Dame for the following persons**.

NAME *(Please print or type)* AFFILIATION

_____ _____

_____ _____

*Please make check payable to Maryland Section, ACS, and mail together with reservation form to Dr. Allen Bednarczyk, McCormick and Co., Inc., Hunt Valley, MD 21031; or phone 667-7470, 667-7480.

**Return by Friday preceding next meeting.

MARYLAND CHEMIST AWARD

Joyce J. Kaufman, recipient of the Maryland Chemist Award for 1974, was born in New York city. She received her B.S. ("With Honor"), M.S., and Ph.D. degrees (physical chemistry, 1960) from the Johns Hopkins University. From 1960 to 1969, she was a staff scientist at the Martin Company's Research Institute for Advanced Studies, where she was head of the Quantum Chemistry Group of the Physics Department from 1963 on. In 1962, she was a visiting scientist at the Centre de Mechanique Ondulatoire Appliquee, Paris, France. Since 1969, she has been a principal research scientist in the Chemistry Department of the Johns Hopkins University, and an associate professor in the Department of Anesthesiology at the Johns Hopkins School of Medicine.

Dr. Kaufman's major interests are in the applications of quantum chemistry to fields ranging from molecular collisions to molecular medicine. Recently she also has been involved in experimental physicochemical research on drugs that affect the central nervous system.

Dr. Kaufman has lectured by invitation extensively both in the U.S. and abroad. She is the author of more than 75 scientific publications. She has been active in ACS affairs both nationally and in the Maryland Section. She was Chairman of the Maryland Section in 1972 and one of its Councillors from 1968-1971. In 1971 she became a Councillor for the Division of Physical Chemistry. She has served on several ACS Council committees, including Professional Relations, Membership Affairs, and Program Review. She was recently elected to the Middle Atlantic Regional Council Steering Committee.

She has received numerous honors, most recently, the 1974 Garvan Medal of the ACS as the outstanding woman chemist in the U.S., "in recognition of her exceptional research accomplishments in the application of theoretical and quantum chemistry to fields ranging from molecular collisions to molecular medicine." She was named as one of the ten outstanding women in Maryland in 1974. She received a DES "Tres Honorable" in Theoretical Physics from the Sorbonne, Paris, in 1963, and was made a Dame Chevalier, Chapitre Centre National de la Recherche Scientifique, France, 1969.

QUANTUM CHEMISTRY - FROM MOLECULAR COLLISIONS TO MOLECULAR MEDICINE

Illustrative examples will be presented of the theoretical and quantum chemical research of our group on *small*, *medium* and *large* molecules. *SMALL*. Large scale *ab-initio* configuration interaction calculations verified our earlier hypothesis that the experimentally observed apparently anomalous behavior of certain ion-molecule reactions is due to the symmetry and spin restrictions which prohibit the ground state reactants or products from the ground state intermediate. The extension of symmetry and spin restrictions to molecular decomposition will be mentioned and a uniqueness criterion proposed. *MEDIUM*. Recent large basis set *ab-initio* LCAO-MO-SCF calculations on five-member heterocyclics indicate significant differences in energy levels and population analyses compared with smaller basis *ab-initio* calculations, and striking differences with the results of semi-rigorous and semi-empirical molecular orbital calculations. The implications of these differences will be discussed with respect to the reliability of the latter methods for various situations. Our very recent calculational results on boron compounds using the new MX-Xα method show excellent agreement with experiment. *LARGE*. Quantum chemical calculations, topological, topographical, and systems analyses and physicochemical experiments are being performed in a coordinated effort to explain the mechanism of action of drugs that affect the central nervous system: psychoactive compounds, narcotics and narcotic antagonists, and anesthetics.

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holiday greetings

The Central Role of Chemistry

Most natural scientists would readily agree that research in their various fields owes much to tools and insights derived from chemistry. However, fewer realize the full extent of its contributions. For example, biological and medical scientists, while heavily engaged in applying chemistry to their problems, are not aware of its crucial roles in solid-state physics. Lack of awareness extends to an even larger sphere—the pervasiveness of chemistry in efforts to meet societal needs. True, we have all noted applications such as plastics or pharmaceuticals, but we have not had the opportunity to see a comprehensive summary of the great number of ways in which our daily lives are conditioned by products and knowledge that have come out of research laboratories.

Of all the sciences, chemistry has been about the most ineffective in its public relations. This has not been owing to some defect in the character of chemists or their leadership, but rather to special circumstances. Chemistry does not frequently give rise to "spectaculars." Moreover, most chemists work for industry, and companies usually prefer to maintain a low profile.

A recently issued, 600-page report entitled *Chemistry in the Economy** maintains the tradition of a low-key approach, but it does set forth an admirable summary of the role of the science in meeting human needs for food, clothing, shelter, health, energy, communications, transportation, and so forth.

The heart of the report is a series of chapters dealing with such topics as food processing, textile fibers, and electronic equipment. Each of these chapters was prepared by a panel of experts drawn mainly from industry. In each case, an historical approach is taken, with key innovators identified. Major products and processes are explained with sufficient detail to be informative, while not excessively technical. At no point does the report talk down to the reader, yet a university student in freshman chemistry could understand it.

As with most such reports in the various disciplines, it is not entirely clear why the report was written or who was the intended audience. No matter. The report should be read by all academic chemists and their students. The quality of the substantive material is such that it could be used as part of a course. Most chemistry graduates are employed by industry. They and their professors would function more effectively if all understood more clearly what the students were preparing themselves for. In addition, scientists in general who read the report would broaden and enrich their comprehension of the science behind their daily lives.

The report has a particular timeliness. It has been issued at a moment when we must begin to prepare for major changes in the shape of our economy. Our present standard of living is heavily dependent on petroleum hydrocarbons, both for energy and chemical feed stocks. Our economy is also based on the use of a wide variety of other raw materials—many of them imported. The coming years will bring global shortages and high prices, and we will be under strong pressure to make do with domestic resources of energy and materials. Changes in processes and the creation of vast new chemical complexes will be necessary to meet the evolving realities. As the enormous extent of the changes and of society's dependence on science become more apparent, chemistry will emerge as the star performer.—PHILIP H. ABELSON