



THE CHESAPEAKE CHEMIST

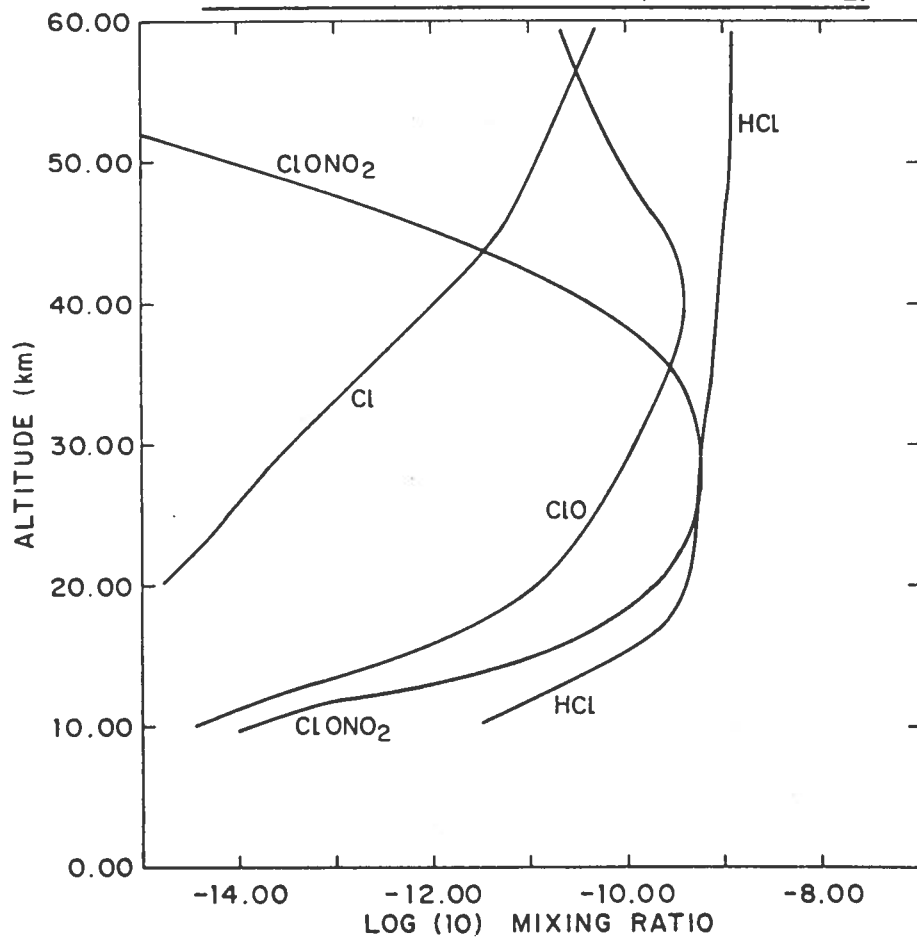
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NUMBER 7

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RICHARD B. WARD

Richard B. Ward is an organic chemist and technical consultant for Du Pont's Organic Chemicals Department, based in the "Freon" Products Laboratory where he is responsible for liaison on toxicology and environmental effects of fluorocarbons. His work also involves formulation studies on a wide range of aerosol products and the investigation of alternative propellants.

Since joining Du Pont in 1959, Dr. Ward has worked on assignments for the "Freon" Products Division including exploratory fluorine chemistry and research in fluorinated polymers, except for a four-year period involving permeation systems supporting the "Permasep" Products Division and the manufacturing section of the Dyes and Chemicals Division.

A native of Felixstowe, England, where he was born in 1932, Dr. Ward received a B.Sc. in chemistry in 1953 from the University of Birmingham and a Ph.D. in organic chemistry from the same university in 1956. On a two-year post-doctoral fellowship from Birmingham University, Dr. Ward studied the radiation of carbohydrates for the United Kingdom Atomic Energy Authority. In 1958, he received a one-year appointment as a Fellow at Ohio State University to study the pyrolysis of carbohydrates.

THE FLUOROCARBON/OZONE QUESTION

The history of environmental studies in fluorocarbons and the introduction of an ozone depletion concept from the Climatic Impact Assessment Program are reviewed. The ozone depletion hypothesis is described. Technical progress made since June 1974 in measurements and theory are discussed together with the resulting impact upon the original hypothesis. This leads to a definition of the key areas of uncertainty and current estimates of the potential effects of these uncertainties on the hypothesis. Finally, mention is made of legislative action and the general concepts for contingency alternatives.

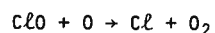
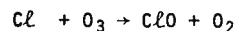
DOUGLAS D. DAVIS

Douglas D. Davis received his B. S. degree from the University of Washington in 1962 and his Ph. D. from the University of Florida in 1966. He has published extensively on the kinetics of reactions involving sulfur and oxygen atoms. Of particular significance are his studies of the reactions between oxygen atoms and oxygen molecules and his studies of chlorine atoms and ClO radicals in the stratosphere.

THE CHLOROFLUOROCARBON/OZONE PROBLEM

The stratosphere contains oxygen atoms as well as ozone that results from the reaction of oxygen atoms with O_2 molecules (in the presence of a third body). The ozone helps screen solar radiation in the 280 - 320 nm region from the earth's surface, where it could, when absorbed by the skin over a long time, contribute to the development of skin cancer.

It has been suggested that chlorofluorocarbons used as aerosol propellants and refrigerants may undergo homolysis under the influence of solar radiation. This would result in the formation of chlorine atoms, which may then deplete oxygen atoms and ozone by the following chain mechanism:



Dr. Davis will discuss his research related to this problem.

--E.F.S.

THE CHESAPEAKE CHEMIST

OCTOBER MEETING

DATE:

Wednesday, October 20, 1976

PLACE:

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

SPEAKERS & TOPICS:

5:30pm
Dr. Richard B. Ward
E. I. DuPont de Nemours & Co., Inc.
"The Fluorocarbon/Ozone Question"

8:30 pm
Dr. Douglas D. Davis
Georgia Institute of Technology
"The Chlorofluorocarbon/Ozone
Problem"

SOCIAL HOUR:

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



Dr. RICHARD B. WARD

COCKTAILS & DINNER:

Eudowood Gardens Dining Room
Cocktails 6:30-7:15

Hot buffet dinner (7:15) at \$6.25
per person. Retired chemists,
students, and their spouses may
attend the dinner at \$4.25 each.

Reservations are necessary for
the dinner and should be made no
later than October 15 with

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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.

(Picture not available)

Dr. DOUGLAS D. DAVIS

OCTOBER 1976

BOOK REVIEW

WASTE NOT, WANT NOT VS WASTE NOT, PROFIT NOT

The Poverty of Power by Barry Commoner; Knopf, 265 pp., \$8.95.
Also reprinted in the *New Yorker*, Feb. 2, 9, & 16 (1976).

The *New Yorker* is a perplexing magazine. Cheek by jowl with glossy ads for the most extravagant of consumer goods can be found some of the most thought provoking articles on abuses of the profit making system which allows for the purchase of these perquisites of the rich. In June of 1962, the *New Yorker* published a three-part serialization of Rachel Carson's *Silent Spring*. The awareness of the abuses of the use of pesticides engendered in the public mind are still with us today (Kepone). In February of 1976 the magazine serialized excerpts from the recognized ecologist Barry Commoner's *The Poverty of Power*, which examines the uses and abuses of energy in a profit-orientated society from the standpoint of the laws of thermodynamics.

Now thermodynamics is a most interesting and complex field of study. How simple and elegant are the two maxims of Rudolf Clausius (1850)--

- (1) Die Energie der Welt ist konstant;
- (2) Die Entropie der Welt strebt einem Maximum zu;

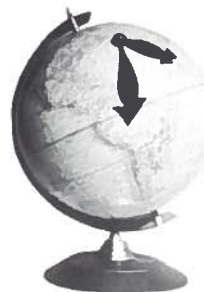
yet how complicated is their interpretation! Oswald Spengler invoked the concept of entropy as a symbol of universal decay in his chapter on Faustian and Apollonian Nature-Knowledge in his *Decline of the West* and C. P. Snow cited the ignorance the Second Law amongst the English intelligensia as evidence of his Two Cultures Theory. Commoner, too, says the time has come for the educated man to learn his thermo and for him to realize that it is the Second Law that really counts.

Commoner divides his argument for a better understanding of the relationship of energy to our well-being into sections dealing with:

- a) energy and the laws of thermodynamics;
- b) the importance of the Second Law because it is related to the efficiency of the use of energy;
- c) problems with oil and coal;
- d) a vigorous attack on nuclear power which he characterizes as "thermodynamic overkill;"
- e) a paean on solar energy as the hope for the future (Commoner is a disciple of the late Farrington Daniels - an early proponent of solar energy);
- f) an examination of the uses and abuses of energy and economic theory which attacks the maximization of profits as the sole criteria of what is best economically.

In summary, Commoner purposes solar energy and social democracy as solutions to economic woes as he perceives them. Needless to say, an analysis which covers a spectrum from thermodynamics to Marx's Laws of Capital Accumulation in some 265 pages is a bit much to digest. But the sections dealing with the history of thermodynamics, the problems with current sources of energy, and the hope that solar energy offers are very fine indeed. This is a timely book on a difficult problem by an articulate spokesman for man's accountability to Nature and to future generations.

-- C.E.M.



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AWIS FORMS A WASH-BALTO CHAPTER

The Association for Women in Science, a national organization dedicated "...to promote equal opportunities for women to enter the scientific professions and to achieve their career goals..." has recently formed a Washington-Baltimore area chapter. Meetings have included a wine and cheese reception and a panel discussion on obtaining employment. Groups will work on such problems as job placement (a local file), government relations, and funding opportunities.

Membership in AWIS is open to men and women who support the aims of AWIS; local chapter meetings are open to all interested people. For more information, write the AWIS national office at Suite 1122, 1342 Connecticut Avenue, N.W., Washington, D. C., 20036 (phone (202)-833-1998); or call Linda Sweeting (301)-444-2415 or Connie Oliver (301)-496-5681.

TEAR-OUT DINNER RESERVATION FORM

Enclosed is \$ _____ (\$6.25 per person)* for dinner reservations at the Eudwood Gardens Dining Room for the following persons:

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*Please make check payable to Maryland Section, ACS, and mail together with reservation form to Dr. Ernest Silversmith, 2607 Taney Road, Baltimore, MD 21209. Or phone 893-3216 (9-5 only).

Return by Friday preceding meeting date.

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