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## Letters

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Copy A. J.

## Industrial chemistry course

SIR: Your recent discussion (C&EN, Feb. 9, page 43) regarding academic vs. industrial or chemical engineering thinking and preparation of students was read with much interest. I have been concerned with the matter for some time, and have spent many an hour with my industrial friends in discussion regarding graduates and how much training was necessary to "fit" them for their new job.

Our department has begun to attack the problem by implementing a new "industrial chemistry" major. This program has been met with much enthusiasm and cooperation from our local industry, and is apparently being met with equal enthusiasm by our students and administration. We expect to share some of our costs, ideas, and personnel—through seminars, laboratory interaction, guest (industry) lectures, and internships.

I know that others have had successful experiences along similar lines, and would not be a bit surprised to see that the traditional "standoffishness" (on both sides) will soon give way to a spirit of cooperation. After all, whenever I have discussed the matter one-on-one I have found that we are not so far from our brothers after all; it is the larger group meeting which leads to arguments—perhaps that is the nature of the human being.

Thomas Neil

Associate Professor of Chemistry, Keene State College, N.H.

## On studying cancer causes

SIR: I read with interest the report called Science Update—Biochemistry in the March 2 issue. On page 29 the subject of research into causes for cancer is discussed.

I wonder if the reason our nation has failed to find the means by which cancer is started is because most of the effort, such as that of the National Cancer Institute, has been directed towards finding a "chemical" cause instead of a natural biological cause, as discussed in the article?

As a result of Congress and the Delaney clause of the Food & Drug Act, we have been in a position of their having predetermined that there are indeed sinister causes for cancer. Too bad research cannot be conducted in the proper atmosphere instead of being directed by people with no knowledge of science.

Consultant, Orinda, Calif.

R. W. Little

## More on nuclear arms race

SIR: You will no doubt receive several letters which state that the article on the nuclear arms race does not belong in C&EN. As a reason the writers will state that it is not chemical or scientific in nature, and thus has no connection with the American Chemical Society.

Let me suggest to these people, and others, another point of view, another way of thinking.

As a chemist (or other scientist) you are practicing a science which is of great interest to you, of great value to you, other than as a mere means of livelihood. Most of you think that it is important that chemistry (and all science) continue to exist and continue to progress. The existence of science and the progress of science are something to which you attach a high valuation.

Those who have studied the nuclear war situation agree that the degree of probability of a nuclear war is pretty much a random phenomenon: The chance of nuclear catastrophe increases as the number of weapons increases, as the proliferation increases, and as time goes on. The chance of nuclear catastrophe is now high and constantly increasing: It is now "four minutes to midnight."

A major nuclear war will not destroy mankind, but will demolish the technologically advanced nations. Chaos will reign. Transportation will come virtually to a standstill. Energy supplies, including electricity, will almost vanish. When you flip the switch the NMR instrument will not come on, the centrifuge will not spin, the accelerator will not bombard nuclei. Most science libraries will disappear in smoke, because most are located in or near cities. Chemical Abstracts will not get the information to abstract, and its computers will not alphabetize. A large percentage of chemists will be dead, because they too are located in or near cities. The science of chemistry will come virtually to a standstill.

Please, if you have any love of chemistry (and science in general), and a desire for its continued development, then join in the efforts to reduce the possibility of nuclear catastrophe.

Kent State University

R. Thomas Myers

## TCDD in hexachlorophene

SIR: I have previously called attention to the 2,3,7,8-tetrachlorodibenzo-dioxin (TCDD, dioxin) contamination of 2,4,5-T and its "effects" on Vietnam veterans exposed to agent orange as being insignificant owing to the low and brief exposures involved (C&EN, Nov. 12, 1979, page 50). In particular I pointed out that the Seveso, Italy, accident with TCDD involved a factory making hexachlorophene, which was and still is used by many doctors and nurses and which was removed from general use in antiseptic soaps in the early seventies after being implicated in the deaths of newborns (C&EN, July 7, 1980, page 50). However, I could not find any literature references to show hexachlorophene being analyzed for TCDD, although Whiteside, in his New Yorker article "The Pendulum and the Toxic Cloud," July 25, 1977, page 30, mentions the association of contaminated 2,4,5-trichlorophenol being common to both 2,4,5-T and hexachlorophene, and the detection of very low levels of TCDD in hexachlorophene in 1976.

I now have found mention in an analytical procedure for hexachlorophene residues (Van Auken, O. W., Hulse, M., "Hexachlorophene,"

Continued on page 58

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# Books

**Characterisation of Catalysts.** J. M. Thomas, R. M. Lambert, editors. xiv + 283 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1981. \$49.

**Chemical and Nonchemical Disinfection.** Nicholas P. Cheremisinoff, Paul N. Cheremisinoff, Richard B. Trattner. xi + 172 pages. Ann Arbor Science Publishers, P.O. Box 1425, Ann Arbor, Mich. 48106. 1981. \$29.50.

**Chemical Engineering Kinetics.** 3rd Ed. J. M. Smith. xix + 676 pages. McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020. 1981. \$27.95.

**Chemical Kinetics and Reaction Mechanisms.** James H. Espenson. x + 218 pages. McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020. 1981. \$24.95.

**Chemistry and Physics of Carbon.** Vol. 16. Philip L. Walker Jr., Peter A. Thrower, editors. xii + 322 pages. Marcel Dekker Inc., 270 Madison Ave., New York, N.Y. 10016. 1981. \$42.50.

**Chemistry: An Introduction to General, Organic, and Biological Chemistry.** Joanne M. Widom, Stuart J. Edelstein. xiv + 743 pages. W. H. Freeman & Co., 660 Market St., San Francisco, Calif. 94104. 1981. \$22.95.

**Chemistry in Two Dimensions: Surfaces.** Gabor A. Somorjai. 575 pages. Cornell University Press, 124 Roberts Pl., Ithaca, N.Y. 14850. 1981. \$48.50.

**Design & Management for Resource Recovery.** Vol. 2. Brenda Harrison, P. Aarne Vesilind. xii + 95 pages. Ann Arbor Science Publishers, P.O. Box 1425, Ann Arbor, Mich. 48106. 1980. \$29.95.

**Design & Management for Resource Recovery.** Vol. 3. Albert J. Klee. xii + 153 pages. Ann Arbor Science Publishers, P.O. Box 1425, Ann Arbor, Mich. 48106. 1980. \$39.

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**Energy, The Biomass Options.** Henry R. Bungay. ix + 347 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1981. \$29.95.

**Environmental Health Chemistry.** James D. McKinney, editor. xiv + 656 pages. Ann Arbor Publishers, P.O. Box 1425, Ann Arbor, Mich. 48106. 1981. \$34.75.

**Inorganic Chemistry in Biology and Medicine.** ACS Symposium Series 140. Arthur E. Martell, editor. viii + 436 pages. American Chemical Society, 1155-16th St., N.W., Washington, D.C. 20036. 1980. \$39.50.

**Introduction to the Magnetic Properties of Solids.** A. S. Chakravarty. xv + 696 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1980. \$65.

**Magnetic Resonance in Biology.** Vol. 1. Jack S. Cohen, editor. xiii + 309 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1980. \$32.50.

**Oxocarbons.** Robert West, editor. xi + 235 pages. Academic Press, 111 Fifth Ave., New York, N.Y. 10003. 1980. \$32.

**Particulates in Water: Characterization, Fate, Effects, and Removal.** Advances in Chemistry Series 189. Michael C. Kavanaugh, James O. Leckie, editors. xi + 401 pages. American Chemical Society, 1155-16th St., N.W., Washington, D.C. 20036. 1980. \$59.50.

**Pentacoordinated Phosphorus.** Vol. 1, Structure and Spectroscopy. ACS Monograph 175. Robert R. Holmes. xi + 479 pages. American Chemical Society, 1155-16th St., N.W., Washington, D.C. 20036. 1980. \$92.

**Pentacoordinated Phosphorus.** Vol. 2, Reaction Mechanisms. ACS Monograph 176. Robert R. Holmes. xi + 237 pages. American Chemical Society, 1155-16th St., N.W., Washington, D.C. 20036. 1980. \$52.

**Pest and Disease Control Handbook.** Nigel Scopes, Michael Ledieu, editors. xvi + 336 pages. BCPC Publications, 74 London Rd., Croydon CR0 2TB, U.K. 1979. \$35.

**The Pesticide Manual.** 6th ed. Charles R. Worthing, editor. ix + 655 pages. British Crop Protection Council, 74 London Rd., Croydon CR0 2TB, U.K. 1979. \$59.95.

**Photoacoustics and Photoacoustic Spectroscopy.** Allan Rosenzweig. xii + 309 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1980. \$35.

**Physical Methods in Modern Chemical Analysis.** Vol. 2. Theodore Kuwana, editor. xi + 411 pages. Academic Press, 111 Fifth Ave., New York, N.Y. 10003. 1980. \$45.

**Plastics.** 6th Ed. H. Harry DuBois, Frederick W. John. xiii + 461 pages. Van Nostrand Reinhold Co., 135 West 50th St., New York, N.Y. 10020. 1980. \$32.

**Polymer Characterization by ESR and NMR.** ACS Symposium Series 142. Arthur E. Woodward, Frank A. Bovey, editors. x + 309 pages. American Chemical Society, 1155-16th St., N.W., Washington, D.C. 20036. 1980. \$32.

**Principles of Desalination.** Parts A & B. 2nd Ed. M. S. Spiegel, A. B. K. Laid, editors. xiii + 821 pages. Academic Press, 111 Fifth Ave., New York, N.Y. 10003. 1980. Pt. A, \$41; Pt. B, \$42.

**Pulp and Paper: Chemistry and Chemical Technology.** 3rd Ed., Vol. II. James P. Casey, editor. xii + 625 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1980. \$50.

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**The Vocabulary of Organic Chemistry.** Milton Orchin et al. ix + 609 pages. John Wiley & Sons Inc., 605 Third Ave., New York, N.Y. 10016. 1980. \$35.

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**Weather Data Handbook: For HVAC and Cooling Equipment Design.** Ecodyne Corp. 299 pages. McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020. 1980. \$32.50.

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**What Every Engineer Should Know About Human Resources Management.** Desmond D. Martin, Richard L. Shell. xii + 176 pages. Marcel Dekker Inc., 270 Madison Ave., New York, N.Y. 10016. 1980. \$12.75.

## Paperbacks

**Coal Ash Disposal: Solid Waste Impacts.** Raymond A. Tripodi, Paul N. Cheremisinoff. 52 pages. Technomic Publishing Co., 265 Post Rd. West, Westport, Conn. 06890. 1980. \$15.

**Contact: Toxics—Guide to Specialists on Toxic Substances.** Richard L. Penberthy, editor. xi + 174 pages. World Environment Center, 300 East 42nd St., New York, N.Y. 10017. 1980. \$49.50.

**Felix Bloch and Twentieth-Century Physics.** M. Chodorow et al. xi + 247 pages. Rice University Campus Store, William Marsh Rice University, P.O. Box 1892, Houston, Tex. 77001. 1980. \$7.00 paperback; \$13 hardcover.

**Man, Religion, and Science.** William Bailey. x + 242 pages. Wm. Bailey, Publisher, P.O. Box 985, Santa Barbara, Calif. 93102. 1979. \$9.95.

**Metric Madness: Over 150 Reasons for NOT Converting to the Metric System.** J. W. Batchelder. xvi + 245 pages. Devin-Adair Co., 143 Sound Beach Ave., Old Greenwich, Conn. 06870. 1981. \$12.95 hardcover; \$5.95 paperback.



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### Letters

Continued from page 2

"Analytical Methods for Pesticides and Plant Growth Regulators," Vol. X, Ed., G. Zweig, Academic Press, New York, 1978) that some commercial hexachlorophene did have TCDD contamination, but no data on frequency or quantity and no references to such data were given. The Food & Drug Administration's "Pesticide Analytical Manual" has a method for TCDD in hexachlorophene submitted in 1974, and correspondence with the Environmental Protection Agency (E. Johnson, March 9, 1981) indicates that hexachlorophene used as an agricultural fungicide-bactericide is supposed to have less than 0.1 ppm of TCDD. However, EPA's "Manual of Chemical Methods for Pesticides and Devices" omits methods for hexachlorophene formulations, as well as methods for TCDD, which raises the question as to when the 0.1-ppm level went into effect.

Obviously, the presence of TCDD as a contaminant in hexachlorophene has been known for some time, and the time has come to drag this skeleton out of the closet to try to find the levels and frequency of contamination before 1970. The past silence on TCDD contamination of hexachlorophene (out of perhaps a dozen articles in the popular literature and scientific news reports on TCDD, only Whiteside has mentioned the 2,4,5-trichlorophenol as the actual contaminated material and the possibility of TCDD in hexachlorophene) does not bode well for perhaps millions of Americans in view of the following uses of hexachlorophene.

As mentioned before, hexachlorophene containing (3%) soaps have been used to scrub before operations by almost all doctors since the early 1950's. From then to the early 1970's, many hexachlorophene-based antiseptic materials were widely advertised and used for acne and scalp conditions. Doctors prescribed at least one soap for douching to control certain vaginal infections. Up until the curtailing of uses in the early 1970's, these products certainly contained some TCDD on some occasions, as no one knew before, and some were found afterwards. While one soap has been monitored carefully since then, the former standard procedure of a douche with it before vaginal operations has just recently been dropped from the list of accepted uses by the company. From these exposures, the women of America who douched with the soaps ought to be our major concern for reproduction difficulties, birth defects in their children, and cancer, rather than the Vietnam veterans.

Beside the direct antiseptic exposures, two new groups—agricultural fungicide applicators and hexachlorophene plant workers—are now identified as having possible chronic exposures to TCDD over many years. Hexachlorophene has been used in a variety of fungicide-bactericide formulations for crops with a wide range of uses in the 1960's (Thomson, W. T., "Agricultural Chemicals—Book IV, Fungicides, Thomson Pub., Davis, Calif., 1967, page 215). By 1976 the uses had been reduced considerably, but no information whatsoever seems to be available on the contamination in the products or in the manufacturing of them.

At the present time EPA has registrations for a hexachlorophene formulation with uses in tomatoes, peppers, and cucumbers for applications made weekly up to three to five days

before harvest, but without tolerances assigned for hexachlorophene residues in the crops.

When compared to the exposures noted above and in 2,4,5-T plants and applicators noted before, the low and brief exposure of the Vietnam veterans has to be considered insignificant, until some people in these severely exposed groups start to show the effects, so far unnoticed in some of these groups, that are claimed by so many veterans. Some people in these groups were exposed to TCDD before the Vietnam war directly using or handling practically daily for years products with possible contamination much greater than in one or two agent orange spray drifts. The doctors and nurses who used hexachlorophene soaps several times a day with vigorous scrubbing certainly had much more effective and frequent exposure to TCDD than the veterans.

The women who douched with the hexachlorophene soaps had such direct contact with their reproductive systems that immediate epidemiologic studies seem to be required. I think these studies should include a reassessment of the connection between vaginal cancer occurring in daughters and diethylstilbestrol taken by their mothers to see if douching with a hexachlorophene soap might be implicated.

I hope that the Vietnam veterans will start realizing that their claims are badly diverting attention from possible serious exposures to TCDD. If the veterans continue to pursue their claims heedlessly, a great deal of time and money will be sacrificed that could otherwise be used by scientists and doctors to find if these more severe exposures have any low latent effects that have so far escaped notice. Throughout this letter the toxicology is based on the concept of higher and/or longer exposures causing greater and/or faster responses. With exposures of hexachlorophene noted here, the TCDD contamination of it requires putting aside its contamination in 2,4,5-T for now.

Rio Piedras, P.R. James A. Singmaster III

### Regulatory madness

SIR: Regarding M. Jeffrey Shoemaker's recent letter (C&EN, Jan. 19, page 106) about the regulation of phenylacetone availability, I became aware of the classification of this common chemical on Schedule II of the Schedules of Controlled Substances recently when our order for a small amount of phenylacetone, which has traditionally been used as one of the unknowns in our undergraduate organic chemistry laboratory, was bounced by a major chemical supplier. Since I do not have Drug Enforcement Administration authorization to possess controlled substances, we had to drop this chemical from our list of unknowns.

I found myself wondering how many more of our organic unknowns would soon be unavailable for the same reason. Will we soon be unable to purchase acetyl chloride simply because it can be used to convert morphine to heroin? Something must be done about this regulatory madness and I wholeheartedly agree with Shoemaker that ACS should take the lead in such an effort.

Kenneth L. Brown  
Associate Professor of Chemistry, University of Texas, Arlington