

64/9/50

FEB 24 1989

Prof. Matthew Meselson,
Dept. of Biochemistry and Molecular Biology
Harvard University,
7 Divinity Avenue,
CAMBRIDGE, MASS 02138,
USA

Dear Matthew,

As regards our work on heat stress, I enclose two recent reports. If our Library can find copies of two earlier ones, they will forward those also. You may get Xerox copies.

The Military Medicine paper has been misinterpreted by some readers. We do not challenge the fact that if endurance times or some other index of strain is measured over a very wide range of WBGT, then a correlation will be found, strain increasing with stress. But in most real climatic situations the range of WBGT will be much narrower, and there will be little relationship between the small variations in WBGT and endurance times or rectal temperature or whatever. The most important factor is encapsulation as opposed to exposed skin.

The most interesting aspect of R-972 to my mind is the length of the recovery periods (Fig 1). Most experiments just measure endurance time, then take the volunteer out of the clothing and send him to the shower. The endurance times thus measured are too optimistic for the real situation, where the person has to continue wearing the clothing. It is clear from Fig 1 that anyone in full clothing at 80% RH will never recover to an acceptable body temperature. If they stop exercise at 39°, they are likely to collapse at 39.5-40° during a rest period.

I would be grateful for any comments you may have to offer.

The correspondence on the Priestley address by Westheimer to the ACS really interested me. A copy of my contribution is enclosed. Is this a general topic for discussion at Harvard? Again any comments will be welcome.

2.

I will be in the USA in April, but again a very brief and full visit.
Hope we will meet one day.

Yours sincerely

A handwritten signature in blue ink, appearing to read "Hugh".

(HUGH D. CRONE)
Research Leader, Protective Chemistry

15 February 1989

Enc. ✓

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LETTERS

Combating chemophobia

SIR: Several years ago, a few miles from some of the greatest centers of chemical education in the country, the Bay Bridge between San Francisco and Oakland was closed for seven hours following the spillage of one 50-lb bag of talc.

The general reaction of the chemical industry to this kind of irrational chemophobia has been a chemophobic panic of its own—the elimination of "chemical" from corporate names, and of "chemistry" from descriptions of its activities.

Meanwhile, day in and day out, the business of chemicals has become fair game for sensation-mongering by the press and by television news. This week, a bylined story in the *San Francisco Chronicle* described industrial alcohol as "a deadly chemical." The expression "cancer causing," used ignorantly and irresponsibly, is heard almost daily on the news.

Editors and TV station managers are, in my experience, sensitive to factual criticism. We have them outnumbered, these keepers of the chemophobia flame. Let's jump on their stories, in writing, until they get their facts straight.

Tom Cleary
Mendocino, Calif.

Priestley Medal address

SIR: I hope I may be permitted some belated comments on Frank H. Westheimer's Priestley Medal address (C&EN, July 4, 1988, page 32) and the subsequent correspondence (C&EN, Aug. 22, 1988, page 3). Our copies of C&EN have been late in coming here [to Australia]. I believe David Waggoner is right to state that science education must begin in the elementary grades; Westheimer discusses college education, but at this stage attitudes have already been formed and students have typed themselves as scientists or humanists. It is too late at college to try to change this. Juergen Braun makes the important point that current attitudes to science are a result of our cultural and social heritage. However, I do not think that any of the three commentators delves to the roots of the matter.

We have built up a distinction between science and the humanities that is purely an artificial distinction, derived from our cultural heritage as suggested by Braun. This division is of comparatively recent date, but perhaps having remoter links to medieval attitudes to

other cultures do not seem to have introduced it. The success of Islamic science between 750 and 1100 AD was built on Quranic injunctions to acquire knowledge and on the absence of distinctions in value between aspects of that knowledge (for example, between science, technology, history, arts, and so forth). Why do we continue to cut learning in half?

It is better that we regard the world of learning as a continuum with the study of the natural world at one pole and the study of the works, thoughts, and aspirations of women and men at the other. Any real-world problem has scientific aspects mingled with human and social ones. An obvious example is the environmental debate around the use of pesticides in agriculture. No one can claim to be educated who cannot show some competence across this spectrum of learning. Science is not an entity separable from the generality of education.

The distinction currently given to science was brought to my attention clearly at my daughters' school, one which places a high priority on girls' getting equal opportunities with boys in math and science. The staff members were very apprehensive about introducing science into the primary school curriculum, afraid that it might be too early. My comment was that science is an integral part of education and begins at day one of school life. Once the education system identifies science as an alien and an add-on, then we have lost the battle. The defeat sustained by Westheimer at Harvard was an inevitable consequence of unrecorded battles lost in primary education.

Let us spread the notion of the universality of learning and rigorously reject all distinctions between branches. To educate, we must engender a curiosity in the natural and the human world, and teach the discipline of learning. There can be no distinction between scientist and nonscientist, or between humanist and nonhumanist. All educated persons are scientists and humanists.

Hugh D. Crone
Heidelberg, Australia

Breath of fresh air

SIR: Congratulations to my fellow chemists and chemical engineers! The letters by A. C. Nixon, Philip Sadtler, and David R. Fagerburg (C&EN, Nov. 21, 1988, page 2) are like a breath of fresh air after the dose of hysteria we have been receiving for years from the