that early man was resistant to the toxic principles but through a rapid, backward evolution lost that resistance in the few thousand years since the advent of cooking.

We are precisely in agreement with Goodhart's statement that the ability of the hominid man to penetrate ranges away from the tropical forests may have been due to the fact that he was able to live largely on meat.

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The *p*H Concept

With all due respect for S. P. L. Sørenson's brilliant contributions to our understanding of *p*H and buffers (News and Comment, 3 Mar., p. 973), the continued teaching of the concept of *p*H has been an educational disaster. Of our annual class of 250 medical students, only about 40 admit that they "understand *p*H"; in fact, not more than 10 can discuss *p*H meaningfully without 4 hours of reviewing their biochemistry. On the other hand, virtually the entire class is immediately comfortable with the concept of "proton concentration," expressed as a molarity.

The persistence of medical school teachers in pushing the *p*H concept has prevented students from a proper understanding of simple and basic ideas in physiology, pharmacology, and biochemistry. For example, they do not find it immediately obvious exactly how *p*H regulates the absorption of various drugs, since they have to memorize certain rules relating *p*H to proton concentration (no matter how simple these rules may be to the teachers). Similar problems arise in the teaching of renal physiology and buffer biochemistry.

In addition to hindering the education of our future doctors, the *p*H concept has been a precedent for a nightmarish research development, many researchers now express the molarity of Ca^{2+} in terms of *p*Ca. Pharmacologists are starting to use *p*D, *p*C, *p*R, *p*A, etc. The expression of experimental data is becoming "overworked," and the reader is less and less sure of what exactly the researcher has done in his laboratory experiments. The *p*H concept often becomes meaningless in molecular biology. If the *p*H in the mitochondrion is around 7, then there are perhaps a mere 1000 protons in the organelle. The *p*H on the edge of membranes is about 5 to 6, the *p*H in the central plane of the membrane is about 10 or 11. It is more meaningful to think about proton concentrations eith-

er in bulk solution or as local variations at interfaces.

Join the crusade to replace the teaching of *p*H by the teaching of proton concentration in all undergraduate courses. We need an organization to promote this cause.

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Limit on Tax Exclusion

The Internal Revenue Service (IRS) allows a tax exclusion of $300 per month for Public Health Service (PHS) (and other) trainees. During the current economic depression, more than the usual number of trainees have received support from PHS training grants for a period of more than 3 years. IRS publication 507 (*1*) states that: "The number of months you may exclude amounts you receive as scholarships or fellowship grants if you are not a candidate for a degree is limited to 36 months during your lifetime." This limitation is not mentioned in PHS publication 1302 (*2*).

On the other hand, the IRS has ruled that postdoctoral appointees who are paid from a training grant, but who are not bona fide trainees, that is, are not deriving primarily training or educational benefits from their appointments, may not take the tax exclusion at all. I call these regulations to the attention of the scientific community because it appears that few of those affected are aware of their existence. It can be disconcerting to find out the hard way.

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Cancer Politics

The letter from a number of cancer scientists (23 June, p. 1288), which referred to the report (News and Comment, 28 Apr., p. 386) on the National Cancer Act by Barbara J. Culliton as "yellow journalism," is reminiscent of past attempts of the current Administration to silence a free press.

The public is protected by a press which is free to criticize people in power, and their actions. Without this free press, politicians become tyrants. The news section of *Science* is an important part of that free press because, until recently, the politicians of science have been almost immune to criticism. The rules of science and academe are different from the rules of politics. Scientist-politicians would like to have it both ways and be able to engage in the ruthless political game under the rules applicable to the scientific and academic communities.

Unrelenting criticism is essential in politics; as Harry Truman said, "If you can't stand the heat, get out of the kitchen." What is going on in the cancer field at the present time is politics, not science. The news staff of *Science* is to be congratulated for its forthrightness and its willingness to take a stand that might be unpopular with people in power. As science becomes larger and more political, there will be an increasing need for reporters who have the knack of being hypercritical.

Carl Baker is very highly thought of among his colleagues, and he has many friends. This is also true of Earl Warren, Richard Nixon, George McGovern, and many other political figures. In the political arena, the kind of criticism that appeared in Culliton's report should be accepted as routine.

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I wish to take strong exception to the attack on Barbara J. Culliton for her report on the National Cancer Act. All of the signers are themselves administrators and apparently feel themselves attacked.

I do not view Culliton's handling of the developments around the National Cancer Act, the National Cancer Institute, and the persons involved as do the signers of the letter. Not being privy to the "political inner workings" of the cancer research industry, I am grateful to her for the kind of exposure in the report, and I congratulate the Editor for publishing it.

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