

CORRESPONDENCE

Smoking and Cancer

SIR,—I was pleased to read your editorial "Premature Puff for Smoking Beagles"¹ and add more information on Dr Hammond's and the American Cancer Society's attitude toward science, methodology, and his colleagues.

Washington University undertook a project early this year, under my direction, with the aim to review some of the crucial data linking smoking to disease. Ten distinguished men and women scientists, from as many leading universities and laboratories, agreed to provide authoritative guidance and to advise us on how to set up conditions that would assure a fair, unbiased and authoritative review of the data. An invitation was also extended to Dr Cuyler Hammond, of the American Cancer Society, to meet with this panel. He was given assurances of all possible safeguards in the use of his data. Dr Hammond's reply was a flat refusal.

Ever since his first survey of smokers and nonsmokers in 1952, the methods by which Dr Hammond obtained data and analysed them have been thoughtfully criticized by some of the world's outstanding statisticians and scientists. The problems created by the objections were never adequately dealt with. Yet there are disturbing possibilities that the association between smoking and lung cancer, presented with such conviction by Dr Hammond, is a spurious by-product of biased sampling methods. There is an equally disturbing possibility that much of the relationship between smoking and lung cancer in Hammond's data may actually be an expression of occupational exposures hidden within these data and not brought out by adequate analysis. As Dr Hammond continues to produce publication after publication based on these same data, many anomalies of the population studied become apparent. In few measures or observations does this study population resemble the make-up of the population of this country. It is becoming increasingly puzzling who really is represented by that sample collected by volunteers of the American Cancer Society.

Most disturbing, however, are some of the ambiguous impressions created by Dr Hammond. Very often these occur in his testimony to Congress, or in some instances his conclusions are based on apparently distorted data summaries. Such testimony does not go through any screening process at all, yet it has an immense influence on planned or actual legislation.

This series of events has serious

implications for science in a free society, particularly for the fuzzy area where science affects public health matters. The refusal of these investigators to make their data available for public review threatens the basic tenet of science in a free society. As often before, the question arises if science can exist unless its actions are kept public. Unfortunately, and again, as often before, the question of credibility of claims based on secret data arises over an extremely unpopular issue.

It is obvious that we cannot, as a community of scientists, examine in detail the data collected by each individual member. It is also equally clear that testimony of experts very often must be accepted. However, as a practical procedure, published results and testimony have meaning only because we assume that, in the event the need arises, the actual data on which the investigator or the expert bases his conclusions are open to inspection. Otherwise, the claims of investigators or the testimony of experts completely lose their credence. Perhaps the matter was stated most succinctly by Bertrand Russell in his discussion of the limitations of the scientific method: "... it is clearly impossible that each of us should verify the facts of geography; but it is important that the opportunity for verification should exist, and that its occasional necessity should be recognized." The transactions of the scientific community must be conducted in public. This tenet is deeply engrained in the process of scientific inquiry. I quote, for instance, the American Association for the Advancement of Science's Committee on Science in the Promotion of Human Welfare: "Science gets at the truth by a continuous process of self-examination which remedies omissions and corrects errors. This process requires free disclosure of results, general dissemination of findings, interpretations, conclusions, and widespread verification and criticism of results and conclusions" (*American Scientist*, 53, June 1965). Data on which scientific claims are based must be public in a sense that they are available for review. Conversely, can one give credence to any widely disseminated claims based on observations which are kept secret or confined? This question is especially pressing in instances where long-range research plans and public actions affecting many individuals have to be based on scientific inference. To give credence to reports based on privileged data is to destroy the validity of the scientific method. The access to data has been restricted before, usually in a "popular" cause. But

whether the issue is one of attacking unpopular genetic theories, or of the right to make a profit by curing cancer, or in the guise of protecting innocent children from a dreadful smoking habit, censorship and secrecy are anathema to science. By his ill-advised actions, Dr Hammond has impugned the credibility of his own claims. There is no review board to which such matters can be referred except the integrity of individual scientists. Thus, I can do no more than bring this matter to the attention of my colleagues. The final action is up to the consensual process of the scientific community.

Yours faithfully,

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¹ *Nature*, 230, 547 (1971).

Indian Brain Drain

SIR,—A few comments on Mr Parthasarathi's article entitled "Brain Drain from Developing Countries", which appeared in the March 12 issue of *Nature*. He has made several good points on this problem. However, in his section on Joint Initiatives, he has suggested that American universities should counsel Indian students to cater to Indian needs. This scheme sounds fair if the Indian government sponsored the graduate students' education. In most cases, the financial assistance to the graduate students is provided by the American universities—so is it not unrealistic to expect American counsellors to be over-enthusiastic in providing the "home country interface"?

Yours faithfully,

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Problematic Chromosomal RNA

SIR,—The comment by your molecular biology correspondent¹ concerning nuclear and, in particular, chromosomal RNA requires comment. We must assume that his interests lie elsewhere or that, perhaps, he has been on an extended