CORRESPONDENCE

Indian Brain Drain

SIR,—Out of nostalgia and loyalty I continue to read the Indian news sheet which the local Indian High Commissioner is kind enough to send me regularly. It appears that recently a new and successful export industry has arisen in frozen frogs' legs. Of course, nobody in India would ever consider eating frogs' legs, except perhaps in unavoidable circumstances, but they do go down well on gourmet tables in the West. But for this appreciation, the frogs would continue to rot in the swamps of India.

Now, Sir, may I commend the enterprise, and generosity of vision involved in this new industry, to the notice of those who worry about the brain drain from the developing countries: in particular, to Dr A. Parthasarathi (*Nature*, 230, 87; 1971). Just because a certain number of scientifically trained persons migrate and do well elsewhere does not prove that their countries could have used them professionally. By all accounts there is a large number of unemployed engineers and other technical personnel in India. Surely it could not be maintained that the laboratories in India were understaffed, or that scientists who are in that country have sufficient material support to be working at their most efficient. They could be overworked, certainly, but not in such activities that any increase in their numbers would improve the situation.

In any case, if in certain areas a need is felt, the governments could always arrange to have people specially trained in that area without setting up the kind of elaborate and generalized controls envisaged by Dr Parthasarathi.

The system of counsellors (advisers) and so on suggested in the latter part of his article has some curious echoes—of a certain mythical unsholderable burden which still bothers the conscience of many a well-meaning white man (to their eternal credit, of course) and of mercenaries fighting against national movements. It is just as well that nothing is likely to come out of it, in view of the present administrative and intellectual turmoil in the universities throughout the West.

The main problem is to make the modern intellectual enterprise a relevant and self-sustaining force in these countries and the profitable and modish export which does no harm to this should be allowed to continue. Surely the countries of their origin have benefited because, for example, Chandrasekhar,

Khorana and Salam were able to use the opportunities they found in other countries.

Yours faithfully,

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Chemistry Teaching

SIR,—Your recent editorial criticism¹ of the report of the Committee of Enquiry which I chaired is seriously misleading because of the many errors of fact it contains, and I must ask for space to reply.

On the matter of broadening of courses you attribute to the committee opinions which it did not express and then criticize those opinions. Thus you point to our findings that some students would like to study a range of subjects outside chemistry and its essential ancillaries, and comment "The only puzzle is that the Eaborn Committee should dismiss the case for broader education without much concern for argument one way or the other". In fact, the clearly expressed view of the committee on this matter was that "It is highly desirable that chemistry students should have the option of spending some of their time outside chemistry and its essential ancillaries; this might be up to 20% of the three-year degree course in England and Wales. Our surveys reveal a substantial demand by students for courses in subjects such as economics and sociology, and we strongly favour such courses being available as options". You further note the wish of employers for inclusion in the course of commercial subjects (operational research, cost-accounting, marketing, industrial relations, computer programming, and so on), and state that "the committee takes the line that there is no time for luxuries like that". On the contrary, while we did, surely realistically, say that not all such subjects could be included in every chemistry course, we recommended that they should be available as options, saying in this context that "The differing inclinations of students can best be accommodated at present by setting aside time for a range of optional subjects other than chemistry and its essential ancillaries". Of computer programming, however, we stated unequivocally that "all chemistry students should receive instruction in this topic". Degrees in chemistry are already broader than those

in some other sciences, since, except in one university, they involve courses in physics and mathematics, so that, with the same exception, the student spends between half and two-thirds of his time on chemistry as such. If our proposals for setting aside 20% of the time for optional subjects outside chemistry and its essential ancillaries were adopted, along with our recommendation that computer programming be included in all the courses, the students who wished to take up the options would spend no more than 40%–50% of their three years on the study of chemistry.

You also criticize the committee for disregarding the complaints of many chemistry students that too much factual material has to be remembered and that the work load is too heavy. On the contrary, we called on university teachers to examine the factual content of courses with a view to reducing it, and added "While emphasis on the memorizing of facts has decreased markedly in recent years, it is likely that this movement still has some way to go", furthermore commenting that "Provided that the graduate emerges with an adequate background of information and understanding, the attitude the course has induced in him is much more important than his detailed knowledge". We also expressed the view that the heavy work-load in chemistry prevents many students from reaping the full intellectual benefits of the university environment, and called on teachers to "consider carefully whether the work load in chemistry cannot be significantly reduced without serious loss of coverage", pointing to ways in which cuts could be made. We furthermore recommended that the time spent in laboratory classes should be reduced to the minimum necessary to meet a limited aim which we defined.

I will not attempt to deal with all the remaining inaccuracies in your account, but make brief comments on only three of them, as follows: (i) There is no justification for your statement that the committee, after pointing out some advantages of the present courses, "deplores the way in which students appear to be increasingly unwilling to exploit these advantages". On the contrary, we drew attention to the students' viewpoints, and commented "University chemistry teachers must take account of the changing undergraduate attitudes, and ensure that their courses are in every way as attractive as possible to good students,