CORRESPONDENCE

British Astronomy

SIR,—As a result of the vagaries in the transatlantic mail, I have only just seen the remarkable letter by Geoff Burbidge on British optical astronomy (*Nature*, **239**, 117; 1972). I should like to endorse everything said in that letter; at last somebody has had the courage to publish the truth on the lamentable state of this subject in Britain. The situation has been fairly obvious for years but too many of us have lacked the guts to say so for fear of upsetting an apple cart which has in fact been stuck in a mire of shortsightedness and national self-satisfaction for the last half century. British optical astronomers must judge and be judged on an international scale. On this scale, Britain has undoubtedly been getting a very poor return for money invested in the field and no excuses or rationalizations (for example, poor weather) can alter the fact.

Clearly this situation cannot be allowed to continue. One solution would be to get out of optical astronomy altogether and to close down existing observatories. In my opinion this would be wrong, at least until alternatives have been tried. In the foreseeable future astrophysics will be one of the most exciting and productive areas of physical research. It is also probably true that optical astronomy will, for some time, be potentially able to deliver more information per unit investment in time and equipment than astronomy in other wavelength bands. (For example, the only reliable distance indicator for extragalactic objects is furnished by optical astronomy.) A viable optical astronomy programme is thus important if not vital for a healthy development in astrophysics. This point has been recognized by the Americans in setting up National Observatories at Kitt Peak and Cerro Tololo, by the Russians in building the 240 inch telescope at a site in the Caucasus Mountains and by various European countries in establishing the European Southern Observatory (ESO) in addition to their various national schemes. This point of view has also been accepted by the SRC which has continued to provide adequate funds for optical astronomy. The main barrier to progress lies in the British astronomical establishment, both in its organization and in its membership. Only if both are changed drastically can British optical astronomy hope to make the grade internationally. Only then will Burbidge's catalogue of major mistakes come to an end.

Given that the sickness has at last

been recognized, what is required for a cure? First of all, a new National Centre must be set up along the lines recommended by the NHRC and should be responsible for building and running all overseas optical (and infrared) installations. The old observatories just will not do since their habits of inertia seem too deeply ingrained to change; they should be pruned, preferably sharply. (Some of your readers will no doubt be aware that the Germans have, in similar circumstances, adopted precisely such a policy in setting up the Max Planck Institut für Astronomie at Heidelberg.)

To ensure rapid progress, the new Centre must be staffed with demonstrably successful astronomers even if this inevitably means recruiting from overseas, at least initially. Decent observing facilities of proven design must be set up as soon as possible at a site of established quality. This means appointing a project manager with full responsibility for the scheme and an end to the practice of eternal consultations with everybody. Allocation of observing time and funding of research proposals should be much more competitive and preferably subject to review by international experts. Results should be the only criterion, not accent, origin or some long standing tradition. Above all, good leadership is required if a revival in optical astronomy is to take place. In this respect the recent return to England of Geoff and Margaret Burbidge augurs well. Together they constitute one of the most successful research teams in astronomy today. Given the support both of British astronomers and of the SRC they stand an excellent chance of revitalizing the British astronomical scene. Having worked with them in the US I should, however, emphasize that their overriding interest is in obtaining astronomical results and that if continued attempts are made to frustrate their efforts (particularly in the name of the "British way of doing things") I, for one, doubt that they will stay for long.

The time has obviously come for the British to decide whether they are serious about optical astronomy and, if so, to insist on a new, more cooperative and more outward looking way of proceeding. If not, they might as well get out of the field altogether and save themselves a considerable amount of money and ridicule.

Yours faithfully,

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Katchalsky

SIR,—The creation of an international Katchalsky fellowship has been criticized by some of your correspondents who state that this would provide moral support for the Israeli government (*Nature*, **238**, 236; 1972). It is not our intention to discuss politics in *Nature* but we feel obliged to reply on behalf of the memory of the scientist and humanist Aharon Katchalsky.

It is evident that the choice of any country on Earth for the location of an international institution has some political implication. But there is indeed no government that could not be criticized and condemned by some scientists for some aspects of its politics: the United States for the Vietnam war, the Soviet Union for the invasion in Czechoslovakia, France for the Algerian war, and so on . . . If military affairs were sufficient to prevent the establishment of international scientific institutions in a country, the only place of choice would be another planet. Once it is recognized that there is necessity for science on Earth, political considerations should never be a reason for exclusion of the scientists of any country from the international scientific community. One of the results of such a discriminatory and unscientific attitude can be seen in the manner your two correspondents treat historical information. For instance, they try to link Katchalsky as a former leader of the Hagannah to Deir Yassin and other Arab-Israeli hostilities. In reality, Deir Yassin was the act of some men of the Irgoun group. The Hagannah fought this group and the Irgoun terrorists responsible for Deir Yassin were prosecuted.

The efforts of many scientists who, like Katchalsky, stand up for humanity and against wars should not be undermined by distortions and the request to boycott the scientists of a particular nation.

Yours faithfully,

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Science and Politics

SIR,—I wish to reply to the letter of Cohen *et al.* (*Nature*, **237**, 469; 1972) regarding NATO sponsorship of an Advanced Study Institute on proteins of

the nervous system. This is not the first attack on the NATO Science Programme, and it displays the same reluctance as others to consider the relevant and quite readily available facts. The authors of the letter raise three questions and then make a number of points of debatable relevance. Perhaps direct answers to these questions would be helpful to your readers.

What are the motivations and purposes of the sponsors? The NATO Science Programme was established in 1958 to strengthen the competence and capabilities of the scientific communities of the member countries. This was (and is) believed to contribute to the security of these countries as do strong and viable economies, orderly political institutions, cultural ties and even military capabilities. The programme is designed and guided by a Science Committee composed of senior scientific advisers from each country; the consensus of their individual viewpoints decides the programme. Their goal is clearly the healthy progress of science through provision of opportunities for education, research and communication. Since 1958 approximately 10,000 NATO Fellows have spent up to a year or more in the laboratories of foreign colleagues. Over 500 research grants have brought together techniques and samples, theoreticians and experimentalists, measurements and their interpreters, in fields ranging from aeronomy to zoology. Some 600 Advanced Study Institutes (ASIs) have been sponsored, permitting about 40,000 advanced students to take advantage of coherently structured presentations by distinguished groups of international experts.

Is free scientific communication a permitted consequence of the meeting? All of the above activities are carried out with the complete intellectual freedom and communication which is the hallmark of the good scientist. A majority of the ASIs result in published proceedings, many of them considered benchmarks in authoritative treatment of their subjects. Anyone who has taken part in an ASI will confirm that informal, uninhibited communication, during and after the meeting, is strongly encouraged and is a key element in the high reputation of this series (for example, compare Giorgi, *Nature*, **238**, 57; 1972).

Those interested in directing an ASI choose a subject in their own fields of interest and make application to the NATO Secretariat. An advisory panel, composed of distinguished scientists, serving as individual experts rather than governmental representatives, selects the successful applications on the basis of scientific importance and timeliness of subject, and quality of lecturers. The director then selects the participants. It is thus the individual ASI director who has complete control over the choice of

subject, selection of participants, conduct of the ASI and the ultimate publication of its proceedings. Over the years a consistent 10%–20% of the participants have come from non-NATO countries; nationals of almost seventy countries, including Eastern Europe and the USSR have taken part in ASIs. The records show no participation from the Chinese People's Republic or North Vietnam, but this has also been noticeably lacking in other scientific meetings held in Western Europe and North America.

Are the deliberations of the meeting of use for military purposes? Space does not permit a listing of all the ASIs sponsored by NATO; such a list is available upon request. The first six titles in the published 1972 programme may be given as examples: "Magnetic Resonance in Inorganic Chemistry"; "Feldspars"; "Data Bases: Theory and Implementation"; "High Energy Astrophysics"; "Molecular Dynamics in Simple Liquids"; "Modular Functions".

To the extent that the results of these meetings, or any others, or any published research, anywhere, are of use for military purposes, they will quite possibly be so used by anyone who follows such matters for such purposes. But the implication that the fifteen countries in NATO have conspired to spend some £20 million over the last fourteen years for the purpose of reaping direct military benefits from a few deliberately designed conferences is really far-fetched.

Yours faithfully,

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Scientific Community

SIR,—The proposal presented below represents a possible way of remedying three major problems (in my view) of contemporary science—a disintegrating environment within science itself, the misuse of the results of scientific studies and overwhelming problems of communication both within science and between scientists and the general society. The proposal deals specifically mainly with the first problem, but might help with the other two as well.

Most people who become scientists are attracted to the field for a varying mixture of two rather idealistic motivations: the creative joy of it and a feeling of potential contribution to the welfare of humanity. Instead, the contemporary atmosphere is often far different—that of a collection of entrepreneurs struggling for personal power and self-glorification with great determination but little joy, creative or otherwise. The drive to be first to publish is, of course, the major symptom of this atmosphere.

Secrecy, jealousy, exploitation and despair are the costs.

To try to improve the situation, I suggest that scientists with a common research interest form a true intellectual community around that interest. Progress from such a research group would be reported about twice a year in a book which would be derived from a meeting of the group. The book would present data, conclusions and discussion for each sub-area of current research in the form of a collection of papers, but individual contributions would not be identified in the published work. Everyone who contributed would be listed as an author (in alphabetical order) of the book. Each sub-area would have an editor (or editors) who would differ from year to year and be chosen by election. The role of the editor would be to introduce and summarize an area of research—not to decide what is or is not published. People unable to attend could send in their contributions. The book could be published rapidly (perhaps by a photographic printing process) since editorial work should be minimal. The meetings would be advertised well in advance and would be open to anyone; however, each group meeting should be typically rather small because it would deal with an area of specialization (the Temperate Bacteriophage Meeting at Cold Spring Harbor is one example of such a possible group meeting). Alternative proposals are discussed below.

I feel that the procedure outlined above would encourage communication, cooperation and the exchange of ideas among members of the group, since emphasis would be placed on advancing the field as a whole and not on individual contributions. We might hope to regard the communal nature of scientific progress which has already existed as a desirable and important feature rather than something which should be minimized in an effort to emphasize personal contribution. Furthermore, communication with other fields would be greatly improved, since progress in one area of research would be presented, summarized and discussed in a single place, rather than scattered through many journals at many different times. (Of course, communication of results and ideas would not be limited to the annual meetings—only formal publication.) Finally, an association of scientists truly dedicated to the value of science as a creative undertaking and benefit to humanity would be more effective and more highly motivated in pointing out potential values and misuses of their research to the general society.

The major potential disadvantage I can see is that granting agencies might complain that past contributions were not extensively documented. However, since the grant is presumably awarded