

CORRESPONDENCE

NATO and Science

SIR,—I should like to make some points relevant to the controversy about NATO support for science.

NATO is not a source of wealth; the money it distributes for science comes from the member governments. The amount NATO has to spend on science is decided not by the organization itself but, ultimately, by the North Atlantic Council, made up of representatives of the member governments. If NATO did not have a science programme these governments would contribute less to NATO. The bulk of NATO's science spending goes on its scientific fellowships. Here not only is the money provided by the member governments, but also the money is returned to national agencies which administer its distribution. In Britain, for example, the agency is the SRC and in the United States the NSF¹. Thus almost the only effect of NATO participation in this area is to add to the overhead costs and to attach NATO's name to grants provided by the member governments. Would it not be better if the money was given directly to the various non-military national agencies concerned?

Two points made by Mr Kovach (*Nature*, 239, 476; 1972) about the NATO Science Programme require some addition. First, he correctly stated that people from non-NATO countries are free to attend NATO Advanced Study Institutes. However, the leaflet which advertises the Advanced Study Institute Programme makes it clear that "... NATO funds cannot be applied directly to meet the expenses of non-NATO participants". Secondly, I should like to add to the list of Advanced Study Institutes mentioned by Mr Kovach the following conferences, which, while not Advanced Study Institutes, were held under the aegis of the NATO Science Committee and were sponsored by two of its advisory panels: Human Factors in the Design of Weapons Systems, Soesterberg, 1961; Military Logistics, The Hague, 1962; Military Applications of Programmed Learning, Naples, 1965; The Operational Evaluation of ASW Weapons Systems, Paris, 1966¹.

I have no space to discuss in detail the motives behind the NATO science programme. However, it is worth remarking that NATO has always seen the programme as related to its military and political aims. The "philosophy"

behind the programme has been described as the belief that "national and international strength are related directly to progress in science and technology, the basis of economic and military development"¹ and it has been explained that under the work of the Science Committee "science and technology have been analysed continuously as factors helping to guarantee the success of the alliance... engagement in scientific affairs gives NATO values other than purely military ones but ones which are essential in maintaining the strength and the cohesion of the alliance."¹ No reminder should be necessary that the "success of the alliance" has involved support for Portugal's colonial wars in Africa² and, as well as the military dictatorship in Portugal, the more recent military dictatorship in Greece³.

Scientists who oppose the military and political aims of NATO, who do not wish to add to NATO's prestige, or who are against military involvement in science, should refuse to collaborate with the NATO science programme. Instead they should press that the money now given to NATO to spend on science should be given instead to national or international agencies (such as UNESCO) of a non-military nature.

Yours faithfully,

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¹ *NATO and Science*, 142 (NATO, Brussels, 1967).

² Bosgra, S. J., and van Krimpen, C., *Portugal and NATO*, 48 (Angola Comite, Amsterdam, 1969).

³ Wilmers, G., in *Proc. Bertrand Russell Memorial Logic Conference* (in the press).

Peptide Synthesis

SIR,—Your Molecular Biology Correspondent has added to our gaiety on many occasions, and perhaps his opening statement (*Nature*, 239, 252; 1972) that "the evolution of solid state techniques has transformed the craft of peptide synthesis into a relatively routine, or at least not too intimidating operation" was intended in that spirit. It does, however, contrast with the authoritative pronouncement by E. Wunsch (*Angewandte Chemie Int. Edn.*, 10, 791; 1971) that "the Merrifield tech-

nique in its present form is unsuitable for the satisfactory synthesis of higher natural peptides (with more than 15 amino-acid residues)". That was the tenor of discussions at the Third American Peptide Symposium, Boston, June 1972, and the Twelfth European Peptide Symposium, Reinhardtsbrunn, September 1972. Can your correspondent quote a single example of a peptide with twenty or more amino-acid residues which has been synthesized by a solid-phase technique to the normal standards of chemistry?

This is not a merely rhetorical question concerning a point for specialists. The real question is whether molecular biology is to operate at the levels of precision of molecular science or biological science.

Yours faithfully,

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Our Molecular Biology Correspondent replies:

If I have brought gaiety to Liverpool, this is sufficient reward. At the same time I confess that it is at least my aim to operate at the level of precision of molecular science. I would not presume to argue with Professor Kenner about peptide chemistry, but I wonder whether the point of his letter has eluded me. In the first place the work that I discussed in the article to which he takes exception concerned the synthesis of peptides of fourteen residues and no more, to which, he seems to agree, that the solid-state method is applicable. Second, had he quoted my second sentence, and not only the first, he would have come to the caveat about the difficulty of synthesizing long chains. As to his challenge to cite examples of the synthesis of longer peptides than twenty residues, two should suffice: Merrifield synthesized functional ribonuclease (124 residues), and Anfinsen a forty-two residue tract of the staphylococcal nuclease chain. It is true that affinity methods were used to separate correct from incorrect sequences, and perhaps to the true peptide chemist this is not cricket. The fact, nevertheless, as it seems to me, is that the solid-phase technique has for the first time brought at least the more modest essays in peptide synthesis into the range of a great many laboratories,