

dimers as the starting point in the aggregation of protein subunits to produce active enzyme macromolecules.

Recent work with N. M. Green on immunoglobulins provided new insight into the structure of 7S gamma globulin, and was described by Valentine at the third Nobel Symposium in Stockholm in June 1967. A year later this was followed by a beautifully illustrated communication on subunit arrangements in enzymes at the eleventh Nobel Symposium on "Symmetry and Function of Biological Systems at the Macromolecular Level". Shortly afterwards—only three weeks before he died—he delivered an inaugural lecture entitled "Shapes and Symmetries of Biological Molecules" at the fourth European Regional Conference on Electron Microscopy in Rome. His readiness at all times to give advice and help will be sadly missed by his colleagues at Mill Hill.

Correspondence

Biochemistry and Molecular Biology

SIR,—The Working Party on Molecular Biology put forward some worthwhile suggestions for fostering collaboration between different areas of biological research. On the other hand, it was admitted that no satisfactory definition could be given for the term molecular biology, which was abandoned in favour of the general description "biological studies at the molecular level". Thus although the term molecular biology has come into popular use, the implication in the report of the working party is that this is to be regretted. An example of the confusion which its use can generate is to be found in the contents list of Letters to the Editor in the issue of *Nature* for October 19 (220, xiii; 1968). Three consecutive communications deal with the recognition of new forms of enzymes and a fourth concerns chemical and physical properties of the protein collagen. All four describe phenomena having possible implications for the chemical interpretation of biological processes. The first two contributions, which relate to the mechanism of protein synthesis in bacteria, are, however, classified under the heading "Molecular Biology", while the other two, potentially concerned respectively with neural organization and ageing, are classified as "Biochemistry". To the scientist familiar with these fields of interest the different classifications present no difficulty. On the other hand, the use of different terms can in a wider context easily create confusion in the minds of those not in the know, such as schoolboys looking for advice on their future careers, administrators seeking to deploy limited resources in the best interests of science, and, let us not forget, the interested layman.

The working party abandoned the term molecular biology as an adequate description of its field of enquiry, which covered the largest part of biochemistry, biophysics, parts of genetics and other areas with varying claims for inclusion. This being so, it seems advisable to follow its lead and to call a spade a spade, biochemistry biochemistry, etc., etc.

Yours faithfully,
G. R. BARKER

The University,
Manchester, M13-9PL.

Who Wants to be a Scientist?

SIR,—I find it almost incredible that Professor Lowenstein's statement "the success of our technological society depends on the efficiency of scientific effort" appearing at the beginning of "Who Wants to be a Scientist" (*Nature*, 220, 424; 1968) should have been uncritically accepted and implicitly used as a basis for much of the discussion in the article.

If technology is in danger of failing, it is not because of any shortcoming of scientific effort but because this effort has become uncontrolled and undirected, with scientific aims and achievements becoming increasingly unrelated to the social problems of the community. The more advanced technological societies have for some time possessed the potential for satisfying the basic physical needs of all their members, and from this early condition technological progress should provide an increasingly free and rich life for every individual. Instead, even the wealthiest and most technologically advanced society appears incapable of preventing the development within it of large, extremely underprivileged minorities and, through equating progress with material production, is demanding an increasing physical and mental conformity from the "emancipated" affluent.

When so much of the technological effort is squandered on the production of frivolous luxury items requiring massive advertising campaigns to create their market, on the deliberate creation of consumer waste, on enormously expensive national prestige projects such as the Space Race and on the obscene development of ever more efficient and sophisticated weapons for destroying or debilitating humanity, is it surprising that the disillusion of individuals, especially among the young, with the materialistic, destructive standards and values of society results in a lack of enthusiasm for technological science? The increasing number of science graduates who choose to pursue an academic career in preference to one in industry is a reflexion of this disillusion and so may be the falling off in popularity of science subjects in schools in this country. If so, any policy involving a broader, less specialized education up to O-level and beyond is only likely to increase the drift, and making science courses more interesting is likely to result chiefly in an increase in the output of academic scientists.

Until our technological effort is primarily aimed at the achievement of a real, universal, human liberation and a genuine world peace, Professor Lowenstein is likely to have to search elsewhere than among scientists to find young people "enthused with the fervour of their social mission".

Yours faithfully,
G. A. GAUSS

Institute of Geological Sciences,
Southpark,
19 Grange Terrace,
Edinburgh, 9.

Recipe for Change

SIR,—While it is amazing that the Swann committee believes a prime motivation in working for a PhD is a desire to be called "Doctor" by acquaintances (*Nature*, 219, 1295; 1968), it is incredible to suggest that, by dubbing all working engineers "doctor", a significant number of qualified people will be deflected back into industry! The next step would surely be to call everyone with a BSc "professor" or something even more exalted!

British industry should rather examine the vitality of their American counterparts, and learn by example how much can be done by the proper deployment of engineering and science graduates (even PhDs) in all phases of industry including management. It is not by chance that an overwhelming percentage of scientific innovations are made in the United States (as reported in the same issue of *Nature*), and it is not by chance that a PhD can find a career in US industry to be both stimulating and satisfying.

Yours faithfully,
K. W. ARNOLD

Hughes Research Laboratories,
A Division of Hughes Aircraft Company,
3011 Malibu Canyon Road,
Malibu, California.