out the essential points. They are not made superfluous by the historical part of the *Exposition du Système du Monde*, in which Laplace had given a more continuous narrative of the same history, treated with less technical detail and a greater display of eloquence; they still deserve to be consulted for any deeper study. Their first-hand assessment of the extremely active and fertile period extending from Newton's *Principia* to Laplace's own researches is particularly valuable. The reprint is made, not from the original edition of 1825, but from the typographically neater and more correct edition of Laplace's collected works, sponsored by the Académie des Sciences (1882). It is not only a useful addition to Bowditch's translation; it will also afford those many collectors and librarians whose set of the original work lacks the fifth volume a welcome opportunity of completing it.

L. ROSENFELD

Correspondence

DDT in Milk

SIR,—In the biased review on DDT by T. H. Jukes (*Nature*, **225**, 301; 1970), I was personally attacked and misquoted. The fact is that I was invited to the DDT hearing in Madison, Wisconsin, in May 1969 by the Assistant Attorney General of the State of Wisconsin, Robert McConnell, who was the public intervenor in the case.

The presence of DDT in human milk was first reported in 1951. The general public was, however, not told about DDT in human milk until I and others in 1968 and 1969 pointed it out. It was then also pointed out that breast-fed babies ingest more DDT compounds than the acceptable daily intake (ADI), and that the ADI was set without considerations to the long-term effects of DDT compounds on the metabolism of endogenous and xenobiotic compounds as well as to the carcinogenic action in mice of low DDT doses.

The review by Jukes is not even modest—it is meagre. He apparently thinks that possible negative effects of DDT only are acute toxicity symptoms—exactly as the arguments of those who have a vested financial interest that DDT is used indiscriminately—completely disregarding the possible late, long-term effects.

We know now some of the late effects of DDT compounds on wildlife; partly from multi-generational studies. Man has not yet been exposed to the organochlorine pesticides for a full lifetime. As we have very few anamnestic data, we will probably never be able to acquire the epidemiological variables which are necessary for an evaluation of the possible actual hazards.

The use of DDT and other organochlorine compounds has been so ingeniously advocated that we no longer have any proper controls. This is a sufficient reason to ban these almost persistent compounds completely. We may argue about the time to complete the de-escalation, be it one year, two or at most five years, but no other discussions are necessary.

Yours faithfully,
GÖRAN LÖFROTH

University of Stockholm,
Stockholm, Sweden.

Enzymes in Crystals

SIR,—In response to the recent article by your Molecular Biology Correspondent on "Enzymes in Crystals" (*Nature*, **225**, 225; 1970), we would like to clarify his statement concerning the "pardonable satisfaction" with which Professor Lipscomb is said to "contradict with confidence"

the amino-acid sequence of carboxypeptidase A as deduced in our laboratory (Bradshaw *et al.*, *Proc. US Nat. Acad. Sci.*, **63**, 1389; 1969). While the interpretation of the X-ray data by Professor Lipscomb and co-workers (Lipscomb *et al.*, *Proc. US Nat. Acad. Sci.*, **64**, 28; 1969) may contradict three points in the chemical sequence, we, in turn, take a certain degree of satisfaction in being able to supply unequivocal chemical evidence in support of our reported assignments.

It has been established that there are two forms of the enzyme differing at three sites in the polypeptide chain (Pétra *et al.*, *Biochemistry*, **8**, 2762; 1969). Professor Lipscomb believes—solely on the basis of X-ray assignments—that the enzyme used in his studies was of the valine type (Pétra and Neurath, *Biochemistry*, **8**, 2466; 1969). Taking this report at face value, we have prepared pure valine enzyme, by chromatographic means, in order to avoid the allotype controversy. An analysis of the tryptic peptides was conducted specifically to re-examine the residue in position 151. In agreement with our previous report, we have found this residue to be phenylalanine, whereas Professor Lipscomb and co-workers interpreted it to be tryptophan. Although re-examination of the other two sites (residues 93 and 245) in genetically pure enzymes has not been made, there is no question that in the pooled enzyme preparations used in the original studies the chemical identification is correct. At worst, these discrepancies may be due to allotypic variations not previously uncovered.

We do not enjoy a polemic of the relative merits of X-ray and chemical methods for the determination of the structure of an enzyme since, in the final analysis, a combination of both of these methods is the most expeditious approach to the total determination of structure. We feel compelled, however, to set the record straight, to avoid misinterpretation of the report of your Molecular Biology Correspondent.

Yours faithfully,
HANS NEURATH
KENNETH A. WALSH
RALPH A. BRADSHAW

Department of Biochemistry,
University of Washington,
Seattle, Washington,
and
Department of Biological Chemistry,
Washington University School of Medicine,
St Louis, Missouri.

Our Molecular Biology Correspondent writes:

It was certainly not my intention to whip up from the ringside a contest between the sequencers and the crystallographers. And to be fair, Lipscomb and his colleagues did firmly make the point that sequencing by X-ray structure analysis is not on, and probably never will be. It is interesting, just the same, to see how many errors in sequences have been uncovered by crystallographic studies, and indeed how few sequences since insulin have proved correct in every detail—which proves merely that sequencing is still an arduous trade. Professor Neurath's interesting letter shows that there can be other problems than the purely chemical to make life hard for sequencers and crystallographers alike. At the same time there is clearly a conflict still to be resolved between the chemical and crystallographic data. Meanwhile, to set the record straight, Professor Neurath's satisfaction is no whit less pardonable than that of Lipscomb *et al.*

Sternglass's Assumptions

SIR,—Lindop and Rotblat state in their article in *Nature* (**224**, 1257; 1969) that they see no reason why the logarithm of infant mortality should decrease linearly with time; in fact, such a law follows from the simplest of hypotheses. The probability *S* of an infant surviving a given year is

assumed given by the formula $S = \pi(1 - p_i)$, with p_i the probability of succumbing to the i th hazard in that year; thus $\ln S = \sum \ln(1 - p_i)$. It is now reasonable to assume that a given fraction k of the existing hazards is removed each year, so that $d(\ln S)/dt = -k \ln S$, from which $\ln S = A - kt$, with A another constant. Since the annual infant mortality I is equal to $1 - S$, we find that $\ln(1 - I)$ varies linearly with time. When I is small compared with unity (the case considered by Sternglass) a linear variation of $\ln I$ itself is predicted; for larger values of I a departure from linearity occurs.

Yours faithfully,

PHILIP L. TAYLOR

Case Western Reserve University,
Cleveland, Ohio 44106.

View that may Upset Scientists

SIR,—Your editorial of January 31 (*Nature*, 225, 397; 1970) attacked the Thames documentary "And on the Eighth Day" as a symptom of a current "sense of hysteria" over pollution. I will happily defend the programme both in detail and overall, but I think the most important point for your readers is that you misinterpret the message of the film. It is not at all "an attack on rationalism and the pursuit of scientific knowledge". Quite the contrary. What the film queries is whether what today passes for scientific method is a sufficiently sophisticated instrument to cope with complex environmental problems.

In the programme we were arguing that pollution was certainly a cost that ought to be taken into account by industry and had not been. But we were also warning that scientific research could be just as narrow and misleading as old fashioned accountancy. Laboratory results may be incontestable in the laboratory but utterly misleading if too readily applied to the more complex circumstances of the environment. The interaction of variables may mean that the picture as a whole is quite different from the sum of its parts. I am not a scientist, but it seems to me that scientists ought to be examining (more humbly than your editorial) the appropriateness of their methods and outlook to the solution of complex problems.

I think they will also have to accept that if these problems affect all of us then non-scientists will have views on them. If in some respects the world is now a laboratory in which we are all experimental animals, we are unlikely to be reassured by a scientific outlook (or an industrial one) that says that because a danger is not proven with full scientific rigor nothing should be done about it. We cannot wait for proof if the proof may simply confirm that harm is already happening to us.

This view may upset some scientists. Let me make it clear that I do not suggest that a scientist as a scientist should deviate from the most rigorous search for scientific proof. But scientists are also citizens and if, before they have definite proof, they begin to fear that what they are investigating may point to widespread and long term dangers for everyone, they have a duty as citizens to say so. This should not then influence the scientific investigation of these possible dangers, but it most assuredly should influence public policies that may be creating dangers. It should transfer the onus of proof from the critics of hazards to the creators of them—the industrialist, the Atomic Energy Commission, the food manufacturers, the local authorities, the fertilizer producers, the drug manufacturers and so forth.

We cannot continue to assume that any scientific or technological innovation is fine until someone has spent 10 years proving otherwise. That is what the argument is about. You ask confidently, "Must man really be forbidden to use fire?" Your choice of metaphor is unwise.

There are many occasions when men are forbidden to use fire, and rightly. And there are few things more terrifying than fire carelessly used and out of control.

Yours faithfully,

IAN MARTIN

Thames Television Limited,
Kingsway,
London WC2.

University News

Dr Baruj Benacerraf has been appointed Fabyan professor of comparative pathology and head of the Department of Pathology at **Harvard Medical School**. **Professor Ralph Mitchell** has been appointed Gordon McKay professor of applied biology in the Division of Engineering and Applied Physics at **Harvard University**.

Professor H. Jones has been appointed Pro Rector of the **Imperial College of Science and Technology**, **University of London**, and **Professor J. D. Smyth** has been appointed to the chair of parasitology at the College.

Dr Eric R. Bryan has been appointed professor of structural engineering in the Department of Civil Engineering, **University of Salford**.

Appointments

Mr Reginald G. Voysey has been appointed deputy director at the **National Physical Laboratory**.

Professor Lloyd Motz, Columbia University, has succeeded **Dr Irving J. Selikoff** as president of the **New York Academy of Sciences**.

Professor Walther Manshard, Justus Liebig University, has been appointed director of **Unesco's Department of Environmental Sciences and Natural Resources Research**.

Dr Alan L. Pinkerson has been appointed assistant chief of the **Myocardial Infarction Branch of the National Heart and Lung Institute**, **US National Institutes of Health**.

Captain A. A. Murphy has been appointed director of the **Guided Weapons Research and Development (Naval) Branch**, Ministry of Technology, in succession to **Captain K. A. W. Pilgrim**.

Dr L. Rotherham, vice-chancellor of Bath University of Technology, has been appointed chairman of the **Advisory Committee for Scientific and Technical Information**, Department of Education and Science, in succession to **Dr F. S. Dainton**.

Announcements

Professor B. L. Horecker, Albert Einstein College of Medicine, has been elected vice-chairman of the **Pan-American Association of Biochemical Societies** for 1971, and will succeed **Dr D. R. Whitaker**, National Research Council of Canada, as chairman, in 1972.

Professor F. S. LaBella, University of Manitoba, has been awarded the **1969 Steacie Prize** in natural science.

The third **Clark Kerr** award for extraordinary and distinguished contributions to higher education will be presented to **Sir Eric Ashby**.

The managing trustees of the **Drummond Trust** invite applications for a senior Drummond fellowship for research in nutrition. The fellowship will normally be tenable for 2 years and preference will be given to biochemists with interests in the field of inherited metabolic disease. Further details can be obtained from the Honorary Secretary, Drummond Trust, University College London, Gower Street, London WC1.