

He was always interested in the training of young scientists, and his work created a branch of Soviet chemistry that produced many young polymer scientists. He was one of the organizers, and editor in chief, of the Soviet journal *Vysokomolekulyarnye* (high molecular compounds). In Britain his name is familiar in, for example, the documentation of rubber and plastics. His classic work, *Short Sketches in the Physical Chemistry of Polymers*, written in collaboration with Slonimskii, and the Kargin balance for thermomechanical testing of polymers, are often referred to. His work on the thermodynamics of solutions of high molecular compounds and on the structure of polymers made a fundamental contribution to the foundation of modern theories concerned with the processing of plastics, rubbers and synthetic fibres.

Kargin was greatly respected by his own people and by scientists all over the world. He was an international figure, unlike some of his scientist colleagues who rarely left the Soviet Union. For his outstanding scientific achievements he was made a Hero of Socialist Labour, awarded the Order of Lenin three times, the Order of the Red Banner twice and several medals. He also received the Lenin prize and three State Prizes. He became a corresponding member of the USSR Academy of Sciences in 1946 and an Academician in 1953.

Correspondence

Research Associations and Higher Education

SIR,—It is clear that the future of higher education in this country is still uncertain. Even so short a time after the Robbins Report another such study has been called for in the recent Parliamentary Select Committee Report on university reform. This report followed an independent attack on the government's seeming indifference to the well-being of polytechnic development (*Nature*, **224**, 1; 1969).

The trouble with the so-called binary system is that polytechnic training can hardly be regarded as providing a parallel route comparable with that of the university. I would suggest that the status of the polytechnic could be dramatically changed simply by linking the polytechnic movement with that of the industrial research association (RA). Research associations are largely financed by levies and subscriptions from member firms but receive public grants *pro rata* through the Ministry of Technology, although initially it was ordained that they would become self-supporting after a reasonable period. The ministry should now say that this time has arrived and it should divert the grants in a phased operation to the polytechnics, to be used either in developing postgraduate work or in enlarging their sphere of activities in ways of their own choice. The industrial federation would be encouraged to transfer its present RA activities either to the nearest polytechnic or to polytechnics *en bloc*, sharing equipment, buildings and staff so that in effect the RA would become the postgraduate faculty of the polytechnic. The union of the staffs would bring about the oft-claimed advantage of research and teaching being shared.

Where geographically a total transfer would be difficult, firms at present contributing to their RA could make a separate but similar arrangement on a regional basis.

Independent of degree work, special short courses involving expertise at varying levels of the industrial scene would become common and because the RAs do not recognize academic terms their influence would break down this hangover from the university past and ensure a more efficient use of buildings and equipment. This would not mean, of course, interference with the freedom of the industrial federation to continue its present RA; all it would be asked to do would be to pay for it.

I also suggest that the process of setting up of industrial advisory centres in the universities should be halted and the scheme centred on the polytechnics. This would avoid the present waste of effort whereby the Ministry of Technology sets up its industrial liaison officers in universities and polytechnics, although they offer the same service as has already been offered for years by the RAs, often in the same town.

Difficulties of course there would be, but they would not be formidable. The proposal would also silence those critics who suggest it is time that the cost-effectiveness of the RA movement was looked at.

Yours faithfully,

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Enzymes at Houston

SIR,—In the note "Enzymes at Houston" (*Nature*, **223**, 336; 1969), you wrote that "the mood of practising doctors in Britain seems to be running somewhat against enzyme assays just now, at any rate for purposes such as the diagnosis of myocardial infarction". This is not correct. Assays of enzymes, released from damaged myocardial muscle, are increasingly used in diagnosis of infarction. A sharp rise of the serum glutamic-oxaloacetic transaminase (SGOT), maximal at about 24 h after infarction and lasting for only a day or so, is of great value in the detection of myocardial cell damage; this estimation is particularly useful if the electrocardiogram is already abnormal from previous myocardial disorders. A rise of lactic dehydrogenase (LDH) at 4–7 days after infarction is of less value. In other fields of medicine, assays of serum glutamic-pyruvic transaminase (SGPT) provide valuable evidence of liver cell damage, and serum creatinine phosphokinase (CPK) measurements are useful in muscle disorders associated with rapid cell degeneration. The use of other enzyme assays is being explored.

Yours faithfully,

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No Peace for the Wicked

SIR,—Many biologists must disagree with the over-optimistic attitude of the editorial "No peace for the wicked" (*Nature*, **224**, 629; 1969). In particular, it is difficult to understand how anyone with a knowledge of the figures can say that population increase is unlikely to be a social disaster. At present the world population is too large for the amount of food available, in spite of continued agricultural advances. How much longer will our luck last? Little thought is given to the danger of disease, perhaps a new variant of influenza or something similar, sweeping through these large, under-fed, populations of *Homo sapiens* with all the subsequent social upheaval caused by very high death rates.

Isn't it time that biologists and others thought a little more about the advantages of stable populations? After all, species that show large fluctuations in numbers, with all the "misery" of population "crashes", are in the minority.

A stable population could have enormous economic advantages and Britain could set an example to the rest of the world. Man not only needs food and shelter, but also enough room to be able to own his home, for we appear to be a territorial species. We all desire a high degree of education for our children, yet the present system is in chaos for lack of funds. Haven't we perhaps

too many children for the working population to be able to afford to educate them in the way we would wish? This is just one example that could be extended to our other social services. We cannot hope to provide adequate facilities if the proportion of our non-productive population is too large.

Man by his cleverness has been able to control his environment in many ways. It seems little to ask that he should control his rate of breeding. We need a crusade for the two child family and the government could go a long way to encourage this. Nobody, least of all a biologist, is going to ask his fellow beings to forgo the pleasures of children. This is not necessary. Two children per adult female would go a long way towards stabilizing the population and may result in a rapid overall decrease. The advantages to the children would be enormous, for more of them would at least stand the chance of obtaining enough parental attention and care.

Yours faithfully,
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Leonid Meteor Shower

SIR,—I would like to refer to the article "Few Leonids Expected" (*Nature*, 224, 639; 1969). I had the wonderful experience of observing the Leonid meteor shower in November 1933 at Ste Radégonde near Tours, France, from the terrace of the Château de Chatenay. This was destroyed during the war, but owned until recently by the Reuter family of which several still living members observed the meteors with me during dinner time—around 8 p.m., on a beautiful clear evening, the exact date of which I cannot now confirm from my notes—November 17 being a definite possibility. The meteors came so fast that I, too, would venture to say that we saw 1,000 per minute, all coming from a vaguely north-easterly part of the sky falling southward. The phenomenon lasted so long that Mme Reuter—now long dead—insisted on our returning indoors to finish our meal, but there were still some meteors falling long after we had first noticed the shower, watched it for at least 10 minutes, returned indoors and went outside again after perhaps another 15 or even 20 minutes. I have never in all my life watched a similarly impressive natural phenomenon.

Yours faithfully,
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Cyclamates

SIR,—In the leading article in *Nature* (224, 298; 1969), we find the somewhat startling statement that the induction of chromosome breakage in leucocytes by cyclamates, though "ominous", is "... meaningless, because no one yet knows what harm, if any, damaged leucocyte chromosomes do". It may be true that no one knows precisely what harm chromosome breakage may do, but it is well known (see, for example, *Nature*, 217, 507; 1968) that mutagenic and carcinogenic agents frequently cause chromosome breakage. We should like to draw attention to a recent article by Logator *et al.* (*Science*, 165, 1139; 1969) which describes the induction of chromosome breaks in rat spermatogonial cells following injection of low doses (1 mg/kg over a 5 day period) of a cyclamate metabolite, cyclohexylamine. Oser *et al.* (*Nature*, 220, 178; 1968) summarize the evidence for the conversion of cyclamates to cyclohexylamine in man, and present new evidence for this conversion in rats. In either case, since mutagenicity and carcinogenicity are the questions under discussion, would it not be reckless to allow continued

consumption of cyclamates while further tests are being done?

Another leading article (*Nature*, 224, 398; 1969) claims that cyclamates caused no "recorded hurt" during 15 years' use. Even if careful studies had been performed on a possible relation between cyclamate consumption and human malignancy (which we doubt), we would ask if the production of "recorded hurt" to humans during 15 years' use is a valid criterion for the safety of cyclamates or any food additive. While we feel that it is evident to most of *Nature's* readers that this is not a valid criterion, it may not be so clear to readers of the lay press where accounts of this editorial have appeared. Nor, apparently, is it clear to the editors of *Nature*. Thus we feel bound to point out that it is extremely difficult to obtain convincing data on effects of food additives like cyclamates on human consumers. The reasons for this lie in the relatively low expected frequencies of induced tumours or mutations, and the likely long delay between exposure and effect, to say nothing of the difficulty of obtaining adequate controls. But low frequencies and long delays do not make the effects any less disastrous to those human guinea-pigs who are unfortunate enough to experience them.

We also note that *Nature* does not cite France as one of those countries that joined the anticyclamate bandwagon with precipitous and undignified haste. This is presumably because in that country the addition of cyclamates to food products has already been forbidden for some time. There was evidence in France at least 2 years ago of serious health hazards associated with cyclamates (see *Le Monde*, October 21, 1969). This evidence was not cited in *Nature's* editorial.

We would—with *Nature*—condemn US and British officials for the speed with which they reached their conclusions. But we would argue that these conclusions came 2 years too late. Perhaps there were some slow committees at work after all.

Yours faithfully,
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The 15 years for which cyclamates have been used was cited in contrast to the week it took to ban them; it was in no way implied that the past record of cyclamates necessarily justifies their future use. Nor was it implied that cyclamates are necessarily safe but merely that toxicological evidence can often be hard to interpret and needs to be weighed carefully, not in a panic.—Editor, *Nature*.

University News

Professor A. M. Gleason has been appointed the Hollis professor of mathematics and natural philosophy at **Harvard University**. He succeeds Professor J. H. van Vleck, who has retired.

Professor F. M. Carpenter has been appointed the Fisher professor of natural history at **Harvard University** in succession to Professor P. A. Mangelsdorf.

The title of professor of endocrine physiology has been conferred on **Dr J. Lee**, in respect of his post at Charing Cross Hospital Medical School, **University of London**.

Appointments

Dr A. Baker has been appointed the first director of the **Hospital Advisory Service**. Dr Baker, previously at Banstead Hospital and St Mary Abbots Hospital, has for the past year been on secondment from the South-West Metropolitan Regional Hospital Board to the Department of Health and Social Security.