Second, he is a qualified specialist, a scientist. Now he is leaving in order to work on behalf of Israeli science, to work for our opponents, our enemies. And this is even more than anti-patriotism.

Chairman: Thank you. Does anyone else wish to speak? The case is probably completely clear and we can begin voting.

J. V. Medvedkov: Permit me to say something, not everything has been said. I am especially qualified to speak. Before I became involved in soil-sciences, I studied law.

It is, as you know, not only a moral judgement or the opinion of colleagues if Melamed is stripped of his academic titles . . . they give a right to a scientific function, a salary, the possibility of scientific work appropriate to his academic level, admission to libraries etc.

A case like this is treated completely unambiguously by a special juridical act. I mean the Final Act of the Helsinki Accords of 1975. I should like to quote from *Izvestiya*, 2 August 1975.

The submission of an application for reunification of family shall not lead to changes in the rights and duties of the person who made the request or of members of his family.

Hence it is inadmissible that the board should seek to limit Melamed's rights because of his wish for reunion with members of his family in Israel.

I have not heard any proof that Melamed's conduct constitutes an anti-patriotic offence.

It is no accident that in such a complete work of reference as the *Soviet Encyclopaedic Dictionary* (Moscow, 1979) the term "anti-patriotic" does not occur. One can use an expression which comes close to it, namely "anti-Sovietism". This term does occur in the *Soviet Encyclopaedic Dictionary*. On pages 63-64 it says that anti-Sovietism is an attempt to defame and misrepresent everything that the Soviet Union has achieved in economic, political and cultural fields.

When it is stated that Melamed's conduct is anti-patriotic, then he is apparently also accused of anti-Sovietism.

By whom and where has it been proved that Melamed has done anything to misrepresent and run down those things which the Soviet Union has achieved?

His application to emigrate was submitted without any publicity. It is an act which falls within existing laws and standards. He did not give public announcements and did not publish books which misrepresent and run down all that the Soviet Union has achieved . . .

I fear that in fact, the Soviet Union will be harmed by those people who have applied to the board with the demand that Melamed be punished.

Chairman: Any further comments?

Mrs F. Melamed: My husband is ill at the moment and I do not understand how it is possible for his case to be considered in

absentia . . . Today a matter is being discussed that is of vital importance to him. His entire 30 years career in the service of Soviet science has been put in doubt. Can one call such a career unpatriotic? . . . Why do members of the board disregard the signature of the Soviet Union below the Helsinki Final Act?

Professor Epinat'eva: It is one thing if a worker at a normal research institute or even the Academy of Sciences expresses the wish to emigrate, but it is totally different for people working at the university to do so. The latter are dealing with young people, aren't they? The act that Melamed performed distorts the world view of our youth.

S.A. Kats: This concerns the shattering of an entire human life. And you limit yourself to two short sentences. If the matter had been dealt with by the court, the procedure would have been very different.

Professor Kalinin: I am against the fact that "anti-patriotism" and "anti-Sovietism" are equated. When Herzen left Russia, it was an act that we call "anti-Tsarism" and not "anti-patriotism".

It was the last straw to say that Melamed would be anti-Soviet. But can we call his action complimentary to the fatherland? He did not want to leave Moscow State University in order to make life easier for us. So we do not have to make life easier for him . . . I do not think that we are in violation of the Helsinki Accords.

G.O. Marshuhuk: I myself disapprove of Melamed's action, and I told him so. But disapproving is one thing and accusing him of anti-patriotism, and punishing him severely by denying him the right to scientific work is something totally different.

I. S. Irlin: There is no doubt that Melamed behaved within the framework of the law . . . During the past six to seven years, some thirty thousand people left the Soviet Union to be reunited with their families. Among them there were quite a number with doctoral or candidate's degrees. But personally I do not know of any case where one was deprived of his scientific degree. In my opinion the board wants to create a precedent.

Professor V.V. Karus: According to Article 104 of the VAK regulations, one needs three qualities to hold a scientific title: qualification, patriotism and regard for ethical standards . . . Patriotism is love for the fatherland which raised us. But Melamed decided to leave the fatherland at a time of severe international tension and for a country that propagates a malicious hostility against the Soviet Union . . . The right to work will not be taken from him, but why should he get an extra salary for working in a scientific field?

Chairman: I request you to vote for the stripping of Melamed's degree of Candidate of Physico-Mathematical Sciences. For the motion? . . . Carried unanimously. I hereby declare the meeting closed. □

Agricultural biotechnology

Soon to start

Springtime has not induced germination of the British Technology Group's (BTG) plans for an agricultural genetics company but it is still expected to bloom this year. One snag at present seems to be the degree of scepticism among those of the calibre to be potential scientific directors about the ability of any such company to be profitable within five years, as BTG would want.

Although BTG considers the topic too sensitive to discuss, by all other accounts the plan is that the new company should have the same kind of special relationship with the UK Agricultural Research Council (ARC) as does Celltech with the Medical Research Council (MRC). Celltech was also set up by BTG (or, more precisely by the National Enterprise Board which has since fused with the National Research Development Corporation to form BTG) and operates in the field of biotechnology. Its relationship with MRC allows Celltech first refusal on any discoveries within the realms of recombinant DNA and cell hybridization that emerge from the various units of MRC. In return Celltech channels

"I'M SORRY, THE SCIENTIFIC DIRECTOR IS IN CONFERENCE."

money back into MRC and has an obligation to help the council find other commercial outlets for discoveries in which it has no interest.

ARC and many of its employers who work on subjects that will be of interest to the new company (some of whom are already consultants to BTG) tend to be enthusiastic about the prospect for several reasons.

The first is the possibility of an easy and financially beneficial way for ARC to channel its discoveries of commercial potential in the domain of plant breeding. At present it has no such outlet. New strains of plants developed by conventional techniques within ARC institutes have to be given to the National Seed Development Organisation which, although a profitable concern, donates its profits to the Treasury rather than directly to ARC.

For discoveries in gene cloning and transfer, that have some potential for being used in the genetic improvement of plant

strains, ARC has no ready outlet but individuals have sometimes had to contend with the rather persistent advances of some of the several American companies that have been set up in advance of any British counterpart. A special relationship with a company, preferably British, would therefore suit ARC well.

For its part, BTG is believed to have board approval for starting the company and to have a managing director in mind. It has not, however, yet found a scientific director and has met with some refusals already.

One problem facing any potential scientific director is the need to ensure that the company is profitable within five years. That was also the BTG stipulation for Celltech but the problem is greater in plant breeding because the genetic manipulation of plants by modern techniques is far less advanced than is that of bacteria, which Celltech use to make products of commercial value, such as rennin.

Nevertheless the optimists believe that profits could be made within five years by concentrating initial efforts on the improvement of bacterial strains, particularly the nitrogen-fixing *Rhizobium*, which are used to inoculate crop plants and on the development of techniques of clonal and meristem propagation.

Finance for the new company is being arranged by BTG which is almost certain to provide at least one third of the money from its own, governmental coffers. The rest will be raised from private sources.

Peter Newmark

University admissions

Still squeezed

Applications from home and European Community students for undergraduate courses at British universities are likely to be six per cent up this year on last, according to figures released by the Universities Central Council on Admissions (UCCA) (see table). But admissions to courses starting in October 1982 are expected to be down on admissions in October 1981.

This is no surprise. The government has implemented its policy of limiting university places just when the number of 18 year olds in Britain is increasing. Hence, the previous policy of gearing university places to demand has been abandoned. The Department of Education and Science, in recent evidence to the House of Commons Public Accounts Committee, has thrown

light on how this policy may affect potential students. The table below shows the department's estimate of the numbers of potential students that may be deprived of a university place in the academic years 1981-82 to 1983-84.

Understandably, universities hope to make up the fees lost from home students by taking in more students from overseas. But their aim has been made more difficult since the government removed the subsidy from overseas student fees. The figures clearly show that full economic fees have deterred a high percentage of potential overseas applicants.

The number of overseas admissions, however, is not necessarily a constant proportion of applications. UCCA statistics suggest that the shortfall in acceptances of places from overseas students in October 1981 over October 1980 was only 19 per cent, compared with the 34.5 per cent shortfall in applications. But statistics compiled by the University Grants

Annual percentage change in applications for undergraduate courses at UK universities

	1980 over 1979	1981 over 1980	1982 over 1981
Home students	+3.5	+4	+6*
Overseas students	-12	-34.5	-20*

*Estimates.

Committee (UGC) suggested an even smaller shortfall in overseas admissions: only two per cent in 1981 over 1980. This apparent discrepancy seems to be explained by the fact that UGC includes admissions for more non-degree undergraduate courses than does UCCA. So it seems that overseas students are now opting for shorter, less costly courses.

Last week, the House of Commons Public Accounts Committee published the report of its findings on the administration of university grants. The committee seemed pleased with the move by the education department to reduce the amount of university income not subject to cash limits by transferring the grant paid to home students for their fees directly into the universities' purse. The universities are praised for keeping their student intake on target last October (a 4 per cent shortfall over the previous year) — but the polytechnics, and other institutions of higher education, come in for a drubbing for increasing their intake by 18.2 per cent over the previous year. The committee's report urges that the body now being set up to control higher education outside the university sector be developed quickly with full co-operation of UGC and laments the fact that steps to coordinate all aspects of

higher education had not been taken before the cuts to the universities.

The parliamentary committee also seemed satisfied by assurances that the universities are taking care not to offer new tenured appointments with no redundancy clause. The Committee of Vice-Chancellors and Principals has been looking at more flexible forms of contract.

Judy Redfearn

US research support

Question of size

Washington

In coming weeks, the US Congress will probably pass legislation that would give a major shot in the arm to small research and development firms in the United States, many of which suffer in the present economic climate, yet which are major sources of new technical inventions. The legislation is not final, however, and is subject to considerable opposition voiced by spokesmen for the universities and government-sponsored basic research.

The National Science Foundation (NSF) estimates that there are 13,000 small firms in the nation, defined as independently owned firms with 500 or fewer employees and performing research and development work. Although numerous, accounting for 85 per cent of firms involved in such work, these small companies in fact spend only 4 per cent of all industry research and development dollars. In contrast, giants such as McDonnell Douglas and IBM spend 87 per cent of US industry's investment research.

Yet there is ample evidence that most innovations come from small firms. One 1976 study showed that small firms produce 24 times as many innovations per research and development dollar as large ones, even though the small firms receive only 2 per cent of total federal support for industrial research.

Small business found a champion last year in Warren Rudman a freshman republican senator from New Hampshire. Rudman introduced a bill that would set aside one per cent of all federal research and development funds — which total some \$40,000 million — for small firms. They would compete for the money by applying to separate federal agencies for grants, awarded on a peer review basis, as seed money. If the work was fruitful, some firms would qualify for follow-on funding. In a third phase, the money would have to come from the private sector, or from other government sources if the government was interested in the company's work.

The plan was modelled on the Small Business Innovation Research Program run by NSF, and a newer, similar programme run by the Department of Defense. The NSF programme gave some \$5 million in seed money to 42 small firms in 1977. By 1981, the 11 of them that qualified for follow-on funding had

No. of home students, aged under 21, entering university (thousands)

	1980-81*	1981-82	1982-83	1983-84
UGC targets	67.3	65.2	63.1	60.9
Target to maintain 1980-81 age participation rate†	67.3	68.5	70.4	69.5

* Actual intake

† Age participation rate is the percentage of 18-21 year olds in the population entering university, which was 7.5% in 1980-81.