supported universities might legitimately seek to differ in character from each other comes into its own only at the other end of the spectrum, at institutions that are essentially vocational in character. The paradoxical result is that there seems no way in which the public university system could at present generate within its own ranks the kind of diversity that gives strength even to the publicly supported universities in the United States (or even within the University of California). And while the private universities in Japan are not merely free but even compelled to respond to a diversity of market forces, their freedom to decide what kinds of institutions they seek to be is more narrowly compromised (which is in no sense to suggest that the private universities are second-rate places but merely that they have to struggle harder to keep alive). □

China's reactors

The US Administration should sell nuclear technology to China only at a diplomatic price.

THE ambition of the United States to sell two reactors to mainland China has been well advertised for the past several months. With the nuclear industry in the doldrums, everywhere, the commercial pressures to arrive at some kind of arrangement are necessarily strong. And since China is almost certain to be one of the principal builders of nuclear power stations in the coming decades, and the only one without first-hand experience of building them, the political as well as commercial prizes to be won by helping with the enterprise from the outset may be very large. The administration's hope that it will be possible to override the requirements of the Atomic Energy Act (see p.677) is therefore understandable.

Even so, the administration should be careful.. Among nuclear powers, China is out of the ordinary. So far as can be told, China stands out among the five declared manufacturers of nuclear weapons in its reliance so far on enriched uranium manufactured by means of an isotopic separation plant. The four others make nuclear explosives from reactor plutonium as well. So, in principle, sypplying reactors to China without full safeguards on the uses that may be made of the spent nuclear fuel will qualitatively augment China's capacity to manufacturer nuclear weapons, and provide more flexibility of design as well. This may not amount to nuclear proliferation in the strict sense, and in any case there is no evidence that China wants to build reactors so as to make nuclear explosives. But on the face of things, what is proposed is contrary to the spirit if not the letter of US legislation on the subject.

A more serious problem is that there is an obvious inconsistency in the proposal that reactors should be built in China without full safeguards so soon after the United States was prevented from supplying spare parts for US reactors built several years ago in India. The obvious source of the difficulty is that the Anti-Proliferation Act distinguishes between nuclear and non-nuclear powers, allowing the supply of nuclear materials to the former (on terms negotiated bilaterally) but not the latter. Curiously, the act seems to provide an incentive for non-nuclear powers to make bombs and thus to qualify for an enhanced status. This should be a reminder to the US administration that President Carter's Anti-Proliferation Act, always offensive to non-nuclear signatories on the Non-Proliferation Treaty, as a unilateral imposition, is also shot through with anomalies.

The administration must also calculate its negotiating power more strongly than it has done so far. China has encouragingly joined the UN International Atomic Energy Agency, but that by itself counts for nothing in the safeguards context. What the international community needs is that China should adhere to the Non-Proliferation Treaty as a nuclear power (just as France should), thus providing a means by which it could eventually be drawn into negotiations on the control fo nuclear weapons. That is the least that the United States should be asking for in return for supplying reactor technology now. It is not a question of what the law says, but what the administration has the wit to ask for. □

East-West bridges

The death of Piotr Kapitza is a sad blow for international relations.

THE death last week in the Soviet Union of Dr Piotr Kapitza is an especially sad occasion because it breaks one of the few persisting personal links between Soviet science and the West. Kapitza was one of the few Soviet scientists with first-hand experience of working in the West. And while it would be too much to look in the history of relations between the scientific community in the Soviet Union and that elsewhere for signs of a constant beneficial influence by Kapitza, there is no doubt that his presence among the senior members of the Soviet Academy of Sciences has been of great value when East-West relations were sunny.

Kapitza was indeed the archetype of a kind of Soviet scholar that no longer exists. He was born in Kronstadt, the naval base on the Neva downstream from St Petersburg (now Leningrad) in 1894, and visited Britain on an official mission only in 1918, after the Russian Revolution, but by 1921 he had persuaded the Soviet authorities to let him become a research student at the Cavendish Laboratory in Cambridge. By all contemporary accounts, Kapitza's influence on that productive laboratory was profound. Perhaps the most valuable of his innovations at Cambridge was the formation of what afterwards became known as the "Kapitza Club", a kind of dining and discussion club which, from the beginning of Kapitza's second academic year in 1922, became one of the principal means by which the young physics community at Cambridge was stimulated and kept informed of the exciting developments then afoot in mainland Europe. Does Cambridge appreciate even now how much its legendary achievements in the two decades that followed stemmed from the Slav flair for argument that Kapitza brought?

Ernest Rutherford, head of the Cavendish, evidently found Kapitza an appealing character, perhaps even a surrogate son. Kapitza's own research at Cambridge eventually centred on the production of intense magnetic fields, and it seems to be established that Rutherford favoured Kapitza with the assistance needed to recruit the financial support for the construction of the Royal Society Mond Laboratory, opened in 1933 by no less a person than the Prime Minister of Britain, Mr Stanley Baldwin. (Although J. D. Cockcroft, later Lord Cockcroft, an electrical engineer by origin, seems to have helped Kapitza substantially with the design of the equipment for the new laboratory, he complained before his death that his own work on the artificial disintegration of nuclei was, at that time, comparatively starved of funds.) Throughout this period, Kapitza had remained a Soviet citizen and had been allowed to travel freely between Cambridge and the Soviet Union. But at the end of 1934 Kapitza was told that henceforth he must stay in the Soviet Union, with the result that the Soviet Government eventually paid the Cavendish Laboratory £30,000 for the equipment accumulated at the Mond Laboratory. Kapitza (after a period of resistance) became director of the Institute for Physical Problems in Moscow.

There must have been times when the Soviet authorities wondered whether they had acted wisely in keeping Kapitza at home. His dismissal from his post in 1946 and his house arrest thereafter is now attributed to his unwillingness to work on the design of nuclear weapons. Plainly Cambridge had influenced Kapitza just as he had influenced Rutherford's laboratory. But, on balance, Kapitza was well worth the trouble he caused — his Nobel Prize (for his work on superfluid helium, a consequence of what he had planned at Cambridge) and his contributions to the early stages of the Soviet space programme are proof of that. But what both East and West lost in 1934 was the embodiment that Kapitza had then become of the principle that in many circumstances science is more important than citizenship. Kapitza's visit to Britain in 1966, when his academic gown is said still to have been hanging in the Senior Common Room of Trinity College, Cambridge, came so late as simply to demonstrate how wide the gulf had become. His death is a reminder that it needs still to be bridged. □