USSR

● The State Committee of Supply (Gossnab) of the Soviet Union is holding up scientific progress, a recent *Pravda* editorial has implied. Soviet policy is, of course, committed to the idea of the scientific and technical revolution as the panacea for social and economic ills, but according to *Pravda* Gossnab persists in supplying research institutes and experimental enterprises as if they were ordinary industrial concerns.

This criticism, from the official organ of the Party, reinforces the picture presented by individual scientists of a vast bureaucracy of order-forms, in which it is virtually impossible, once a project has started, to acquire some auxiliary equipment or reagents not envisaged in the original plan. The vivid description by such unofficial sources is of a standard procedure which includes over-ordering what is definitely needed and arranging to exchange surpluses with another laboratory to provide for unforeseen requirements. The success of a laboratory, it has even been claimed, depends not so much on the abilities of its top scientists, but on the wiliness of its "Fixer" in arranging such unofficial supplies.

Although *Pravda* makes no overt reference to this self-help system, this is clearly what lies behind the statement that "in the opinion of many scientists and specialists, what is needed is a system for the immediate supply of everything found to be necessary during the course of experiments and the development of experimental models." This "would permit the acceleration of scientific progress", presumably by making allowances for serendipity and eliminating the need for a marked degree of prescience. Gossnab, however, "is delaying with the creation of such a system".

The tendency to treat science as simply another branch of production is not, however, confined to Gossnab. The implementation of basic research in industry is one of the major themes of Soviet planning; considerable funds have accordingly been allocated to this end and a large number of research bases have been set up. Not all these facilities, however, are being used for their proper purpose. Thus, the Ministry of Gas Production has an excellent research establishment at Donetsk, but instead of using it for testing experimental models of new equipment, a large proportion of it has been handed over to routine production, while only a small fraction is used for the prime purpose of research and development. Examples of proper cooperation in this field, such as that developed by the Byelorussian Academy of Sciences and its subsidiary institutes on the one hand, and the industrial enterprises of the Byelorussian Republic on the other, to form what *Pravda* describes as "a truly powerful experimental base of science", are still, it would seem, sufficiently rare to evoke glowing press reports when they occur.

Another major problem facing Soviet research is the lack of sufficient scientific instruments. Here the problem is one of demand exceeding supply, so that in spite of considerable efforts by the relevant Ministries (Instrumentation, Automation and so on) and scientific bodies from the Academy of Sciences downwards, there are still considerable shortages. One recent development has been the establishment of rental centres, from which expensive and complex equipment may be borrowed for specific experimental projects. Such centres are already in operation in Moscow and Leningrad, and the Rental Department of the Siberian Metrology Institute, now in its fourth year of operation, supplies "hundreds of scientific and industrial organisations" of the developing regions of Siberia. The collective use of equipment, whether via rental centres or "on the principle of the comradely mutual aid and cooperation of Institutes" is especially recommended. The use of computers in planning scientific supply is urged, but with the cautious proviso that computers are to be employed thriftily.

For several years now, centralised and computerised planning has been a major aim of the logistics of Soviet science. This new emphasis on economy of computer use, and the suggestion that individual institutes might profitably make mutual equipment-sharing arrangements with other institutes, is a far cry from legalising the present system of unofficial exchanges of specially stockpiled surpluses. It does, however, indicate a growing recognition on the part of the authorities that running research and development on the same state-wide standardised pattern used for the production industries is at least problematical.

● The Soviet space programme, being based on Tsiolkovskii's concept of long-term orbital space stations as a prerequisite of any manned missions to the moon or planets, has always been greatly concerned with the medical problem of prolonged weightlessness. The death of the Soyuz 11 team upon re-entry, although finally proved to be due to a faulty hatch-seal, at first evoked considerable fears that the tragedy was due to some unsuspected side-effect of prolonged weightlessness. Accordingly, in addition to the usual programmes of astrophysical observations and the checking of equipment, the current Soyuz 21/Salyut 5 mission is paying special attention to the effects of weightlessness.

As usual, medical data—cardiovascular and respiratory action—is being telemetered to ground control; in addition, however, the cosmonauts have on board what the TASS agency describes as a special set of scales to enable loss of body mass to be monitored. What precise form these scales take, and how they can operate in conditions of zero gravity, is not specified. A similar question is posed by another on-board experiment—the presence of a tank of guppy fish which will be periodically filmed to record their adaptation (if any) to weightlessness—since submersion in water is a standard procedure for simulating weightlessness in preflight training missions.

Whatever the precise significance of these experiments, however, it seems clear that Soviet plans are moving towards longer and longer missions. Increasing attention is being paid to both physical and psychological well-being—an endless-belt "running track" and a colour-slide projector for light entertainment are carried on the latest mission. A new central control panel aboard Salyut 5 gives greater facility for the cosmonauts to operate scientific equipment during experiments, reducing their dependence on ground control and preparing the way for fully autonomous space missions whether in orbit or beyond.

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