

THE publication in the United States last week of tapes purporting to reveal the "last hours" of Colonel Vladimir Komarov, who perished aboard Soyuz 1, can hardly be considered an auspicious augury for the forthcoming Soyuz-Apollo programme. The tapes raise the whole problem of credibility and completeness of information exchange between the Soviet and American participants.

According to the tapes, the Soyuz was out of control for some 12 hours before the disaster, with Komarov fighting desperately to retain control (taking time off, however, for a farewell to his wife and child, and a talk with Premier Kosygin). According to the official Soviet releases, the flight proceeded normally until the moment of deployment of the parachutes. The Tass communique (April 25, 1967) stated: "After implementation of all the operations connected with transition to the landing regime, the ship successfully completed the most difficult and responsible braking sector in the dense strata of the atmosphere, and fully decelerated from the initial orbital velocity. However, when the main parachute was opened at an altitude of 7 km, a twisting of the parachute lines, according to preliminary data, caused the ship to descend at a great speed which resulted in V. I. Komarov's death".

An article by Yuri Gagarin, who was present at the control centre during the whole re-entry procedure, said much the same. The flight was perfectly normal, he maintained, until the moment when the parachutes should have opened. He described the shock felt by all in the control centre when this last-minute disaster occurred. Gagarin's article appeared in *Komsomolskaya Pravda*, the newspaper of the Young Communist movement (young, in this context, meaning 18-35 years).

Certainly, a number of Western commentators at the time suggested that the spacecraft had been out of control for some time before re-entry—these commentators, however, seemed motivated by a preconceived idea that, since "Soyuz" means union, Komarov's craft was meant to be a participant in a manned link-up, but that difficulties with his craft led to the cancellation of the (presumed) second launch and his "premature" re-entry after only 18 orbits.

Another mystery is the state of Komarov's health. A background article in *Pravda* of April 24, 1967, which had gone to press before the disaster, stated that after the flight of Vostok 4 (for which he was back-up for Popovich), he had developed a heart murmur, but "a good rest, a

more sensible everyday regime, self-confidence and the moral support of his comrades did their work", so that a later medical board found nothing wrong with him, and he was able to make a 24-hour orbital flight in October 1964. Before the flight of Soyuz 1, said this article, he had received "the highest rating". Certainly, it would seem unlikely that any space programme would launch a man in less than perfect health—yet some medical reports which seem to have been written for limited circulation among Soviet experts in space medicine seemed to imply that the proximate cause of the disaster was that Komarov

Soviet diary

from Vera Rich

lost consciousness at a crucial moment during re-entry, implying either that the parachute system had to be deployed by a manual control (out of key with the whole tenor of the Soviet space programme, which places so much emphasis on automation that the early cosmonauts were virtually no more than human test animals) or else that, being unconscious when disaster struck, he was unable to make some last minute effort to save himself.

● One of the contributions of the Byelorussian SSR in the current five-year plan is an extensive programme of the study and conservation of the flora and fauna of the republic. This included the launching of a new popular science journal *Rodnaya Pryroda* (Our native nature), research projects by the various scientific institutes of the republic, and a special prize for the best coverage in the media of the problems of conservation. The programme was clearly aimed at local loyalties and sentiment, with extensive use of the Byelorussian language (although current Soviet policy favours the "unifying" importance of Russian).

According to reports in *Rodnaya Pryroda*, the programme is making excellent progress, no less than 13 of the 48 scheduled "themes" being completed three years ahead of schedule. In at least one respect, however, all is not well with conservation in Byelorussia—the close season for fishing is not being respected. During the spawning season, persons unspecified are "barbarously" fishing for shallow water fish, to the great detriment of the fish reserves of the republic.

To combat this, "all possible forces" are to be mobilised, ranging from the Fisheries Board of the Council of Ministers of the Byelorussian SSR, through the Byelorussian Conservation Society and the Society of Hunters and

Fisherman, down to school-children and the "pioneers" youth organisation. How, precisely, they are to combat the poachers is not explained—presumably by some attempt at patrolling the numerous lakes and rivers of the aquiferous republic. What is more puzzling is who is doing the poaching at all. Byelorussia is not rich in natural resources, and has a long peasant tradition of cautious preservation of the little that is available. Although the new great oil refineries at Novo-Polotsk and Mozyr have brought in many workers from all parts of the Soviet Union, it would be too naive a solution to attribute the depredations to oilmen having a quiet day's angling. The most probable answer seems to be that of 'deculturalisation'—that state planning and state control have destroyed the old, careful traditions, and that rules of conservation which were once an integral part of local tradition now have to be reimposed, by official decree.

● The idea of recovering gold from the sea is not a new one. But attempts to date have all proved uneconomical—the value of the metal recovered being less than the cost of extraction. Now, however, data from the recent Atlantic voyage of the research vessel Mikhail Lomonosov have reopened the question of extracting gold from seawater. Analysis of deep-water samples indicate a gold concentration some 1,000 times higher than expected—a value which, if confirmed for a sufficient number of sites, might well indicate that the metal could be extracted commercially.

The reasons for these high concentrations are as yet a mystery and, not surprisingly, the sites of these anomalies have not been revealed.

● A new means of producing extra-strong concrete has been developed at Naovi (Uzbek SSR)—dropping it. This, according to the inventor, Candidate of Technical Sciences A. K. Brovtsyn, produces "complex physico-technical interactions between the grains of the filler and the cement particles", giving an increase in strength of up to 15%. A pilot plant for dropping concrete components of up to 3 tonnes in weight on to an elastic base from a height of 35 cm has been developed at a cost of 2,000 roubles (£1,000).

● An artificial method of producing triplets from single-yoked eggs has been demonstrated by embryologist, German Svyatogor of Leningrad University. The method consists of surgically opening the egg, dividing the blastocyst with a micro-scalpel, and then resealing the egg. So far, the Novosti agency reports, triplets have been successfully produced, from the eggs of hens, ducks, turkeys and Japanese quail.