

## Dismantling the alliance

Space research is an expensive business, so European countries banded together for the development and management of such programs. The two chief combines are the European Space Research Organization for satellite design and mission planning, and the European Launcher Development Organization to provide boosters for the satellites. Both have suffered from the difficulty European nations traditionally have had working together in scientific and technical areas (SN: 3/30 p. 302). Now, new politico-economic decisions by Great Britain and Italy threaten to do them more long-lasting, and perhaps permanent, damage than technical problems could ever do.

**ESRO's first satellite**—ESRO II-A—was launched last May 29, but never got into orbit due to a faulty fourth-stage engine in the American-built Scout rocket (SN: 6/10/67 p. 544). The next attempt, with an identical satellite, was set for this May 9, yet with this triumph on the horizon, more trouble has appeared.

Italy, which pays roughly 11 percent of ESRO's current budget, announced that it would not pay its proportional share in the cost of two planned ESRO satellites, called TD-1 and TD-2.

On April 26, ESRO announced that Italy's move had forced it to cancel plans for the two satellites. Designed for stellar and solar astronomy, gamma ray and X-ray studies, TD-1 and TD-2 would have been the organization's most ambitious projects to date. The satellites would have weighed 440 and 880 pounds respectively, compared to 164 pounds for the still-upcoming ESRO II-B. The cost of the project, however, has reportedly soared, and the Italian Government is believed to have felt that its share in the TD project—mostly the provision of power supplies—was too slight to justify the commitment.

**Only three** days before the ESRO decision, ELDO got its own lumps with England's announcement that it would not contribute to that organization's proposed budget expansion. This means that once the present program ends, about a year from now, England's contribution to the European booster is virtually over. Until this decision, the British Blue Streak rocket was to have been the first stage of an ELDO rocket capable of launching satellites weighing up to two tons, a necessity if the Continent plans to orbit its own sophisticated communications satellites.

(Originally the Blue Streak was to have been equipped with hydrogen warheads as Britain's chief nuclear weap-

on. When the Government decided that an "independent deterrent" was too expensive, the program was granted a last-minute reprieve by adapting it into a space booster for the proposed ELDO. Unless Britain mounts a more active space program on its own than it looks likely to do, the Blue Streak may now, without ELDO's business, be going down for the last time.)

The U.S. space agency has readily made launch vehicles available to other countries—besides ESRO, England, Australia, Canada and Italy, have all orbited satellites on NASA boosters but it is unlikely that the offer would apply to launching communications satellites that would compete with U.S. efforts in a potentially highly lucrative business. Thus the demise of ELDO's Europa rocket may well leave the members grounded, except for small-scale launches in which less-powerful boosters can be used.

**Panic is not new** for the members of ESRO or ELDO, however. Indeed, it has been said that they were born with it. A. V. Cleaver, a member of the British Interplanetary Society and chief engineer at Rolls Royce, has observed that ELDO was set up not because European leaders believed in the idea, but because fear of being left behind technologically made them afraid to say no.

ESRO, besides being economically expedient for its small members, was a stop-gap against the brain drain, which was losing scientists right and left to the U.S. space program.

As recently as last February, the British Interplanetary Society's Council on European Policy recommended that

### EXTRAGALACTIC

## Clouds rush in toward Milky Way

When radio astronomers look out of our galaxy to the north or the south—the directions in which it is easy to do—they notice patchy clouds of hydrogen. These clouds may be from 20 to 30 light years across and 300 to 450 light years apart.

They weigh on the average about 300 times what the sun does—six billion billion billion metric tons—but their size makes them extremely tenuous, about 10 atoms to the cubic centimeter. Most of the clouds are moving very slowly; 10 kilometers per second is the average speed.

Astronomers had become accustomed to these figures, and it was with some surprise that they began during the last few years to find some excep-



NASA

*ESRO II gets a check out in England.*

tionally fast clouds—with velocities of 100 to 150 kilometers per second. Observers at the Dwingeloo Observatory of Leiden University in the Netherlands, principally Profs. Jan H. Oort and H. C. van de Hulst, have counted at least 30 of these fast clouds that have one peculiar characteristic: They are all coming toward the plane of the galaxy.

**As long as** most space activity is concerned with measuring cosmic rays, analyzing the solar wind and other non-commercial activities, the big space powers may go on helping the small. U.S. boosters will no doubt appear in other countries in the future, and Russia has plans to provide a lift—probably in the form of large rockets—to France (though France is the only European nation to launch its own satellite from its own booster). When the profit motive becomes more important than foreign policy, however, the need for an all-European booster will become more glaringly apparent.

Prof. Oort thinks these clouds—between 900 and 1,500 light years away—are extragalactic objects that have been caught by the gravitational attraction of our galaxy and are crashing into it.

Dwingeloo looks mainly to the north of the galaxy, which is a broad flat disk lying roughly in the east-west di-