

SCIENCE NEWS OF THE WEEK

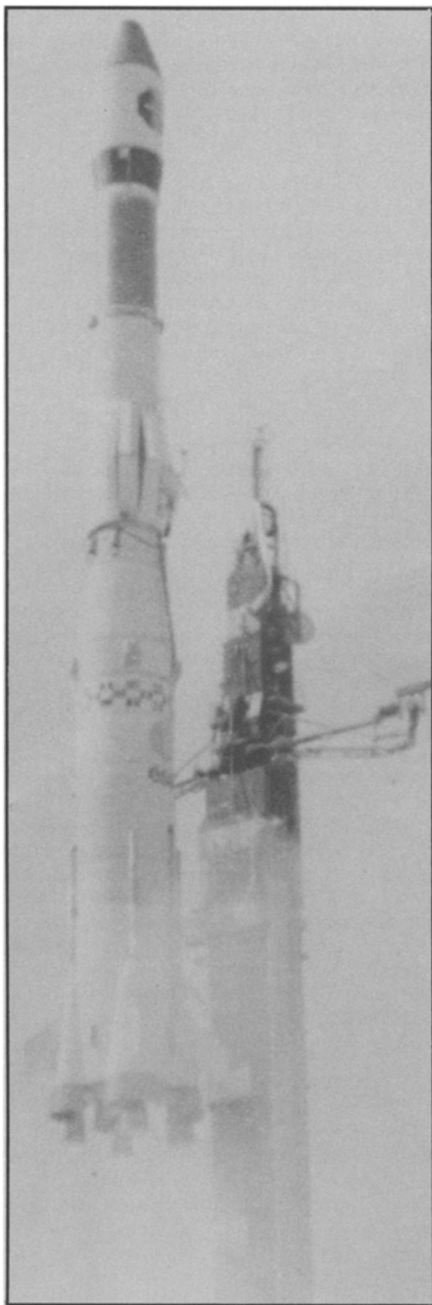
Ariane Makes a Comeback

The European Space Agency's Ariane rocket, aimed to compete directly with the U. S. space shuttle in the growing business of launching the world's satellites, is back in the race after a stumble that was literally explosive. The first Ariane was launched on the day before Christmas of 1979 in a flawless debut that reached orbit within seconds and kilometers of its mission specifications. Number 2, however, proved anything but flawless in its May 23, 1980, liftoff, ending up less than two minutes later in a midair detonation that not only destroyed the rocket and the two satellites it was carrying, but sent an army of engineers on months of frustrating research to understand and correct the malfunction. Last week on June 19 the launch of the third Ariane proved the value of their efforts.

Last year's explosion posed a difficult problem even though telemetry from the rocket had readily revealed a high-frequency vibration in one of its four first-stage engines. Half a dozen specially created working groups investigated possible vibration causes ranging from oil in the propellants to the acoustics of the Guiana launch site before finally focusing on the engine's injector. A two-month test series had apparently solved the problem, until, during subsequent tests to check out the actual injectors for the third flight, a vibration of a different frequency showed up "very suddenly and without warning." More months of testing followed before the engineers finally settled on a modification of the injectors combined with a slight watering of the fuel, which smoothed out its burning at the expense of a small but tolerable reduction in performance. Instead of the originally foreseen five months between the second and third launches, there were 13.

Like the disastrous second flight, number 3 carried a pair of satellites — ESA's second operational weather-watcher, called Meteosat 2, and a geosynchronous communication satellite for India known as Apple (lost with the second Ariane were a scientific probe named Firewheel and the Oscar 9 amateur-radio satellite, both from Germany.) The last of Ariane's four planned "developmental" flights, now targeted for October, will loft an ESA maritime communications satellite called MARECS.

Like the U. S. shuttle, Ariane has a substantial number of "firm" (committed) customers and others who have merely reserved space on particular launches, extending into the mid 1980s. From the first post-developmental flight (number 5, now scheduled for next February) through the 23rd flight in December of 1985, there are firm bookings scheduled for 14 satellites,



Ariane liftoff: June 19, 8:33 a.m. EST.

reservations for 14 more (plus one deep-space probe — the ESA mission to comet Halley) and only three scheduled Arianes whose payloads are yet fully undecided. The firm commitments are from ESA itself, France, Germany, Sweden and the International Telecommunications Satellite Consortium (INTELSAT), while the option-holders range from the United States to the Middle East to Colombia and more. In addition, negotiations for Ariane's launch services are underway between ESA and organizations as diverse as NATO and Southern Pacific. Four of ESA's own

planned payloads, in fact, have yet to stake out their own launch dates.

The U. S. shuttle, meanwhile, has an even busier schedule — though it will not be nearly as active as NASA had anticipated. As recently as December, 48 launches (after the initial test flights) were on the manifest through the end of 1985. Now there are 34. Fully half of the reduction is in the area of science, hard hit in recent budget cuts. A spacecraft to study the poles of the sun (which was to have joined a similar ESA probe) has been canceled; an earth-orbiting Gamma-Ray Observatory and the Venus-Orbiting Imaging Radar spacecraft have been delayed until 1988; and four launchings of the ESA-built Space-lab research module have also been postponed. In addition, factors such as production problems with a weight-saving version of the shuttle's external fuel tank have prompted several potential customers to consider signing up for "old-style" launches by conventional one-shot rockets. This means either the Delta or Atlas-Centaur from NASA's arsenal (both of which might otherwise have been phased out years earlier) — or Ariane. A dozen satellites from the still-changing shuttle manifest are also listed on Ariane's, and in fact, notes a NASA official, "a number of them are triple-booked."

Heightening the competition, ESA is also considering a second launchpad to handle a more powerful version of Ariane and more frequent launches, and studies are underway of recovering and reusing Ariane's upper stages to lower launch costs. □

Fredrickson resigns as NIH director

Donald S. Fredrickson surprised colleagues at the National Institutes of Health last week with the announcement that he plans to resign as of July 1, after directing the Institutes for six years.

"One gets less adept at any job without a sabbatical. There's no sabbatical in a job like this; you either quit or die," Fredrickson told SCIENCE NEWS in an interview on the day he announced his resignation.

He cited personal, not political, reasons for his decision. "The last six years... have been spent in the relentless company of the administrative burdens of the Director. It is time to shed them for a while, lest I forget completely how to be a scientist and a physician," he said in a speech to members of the NIH. (Fredrickson had done research on lipid metabolism and disorders and held numerous research and administrative positions at NIH.)