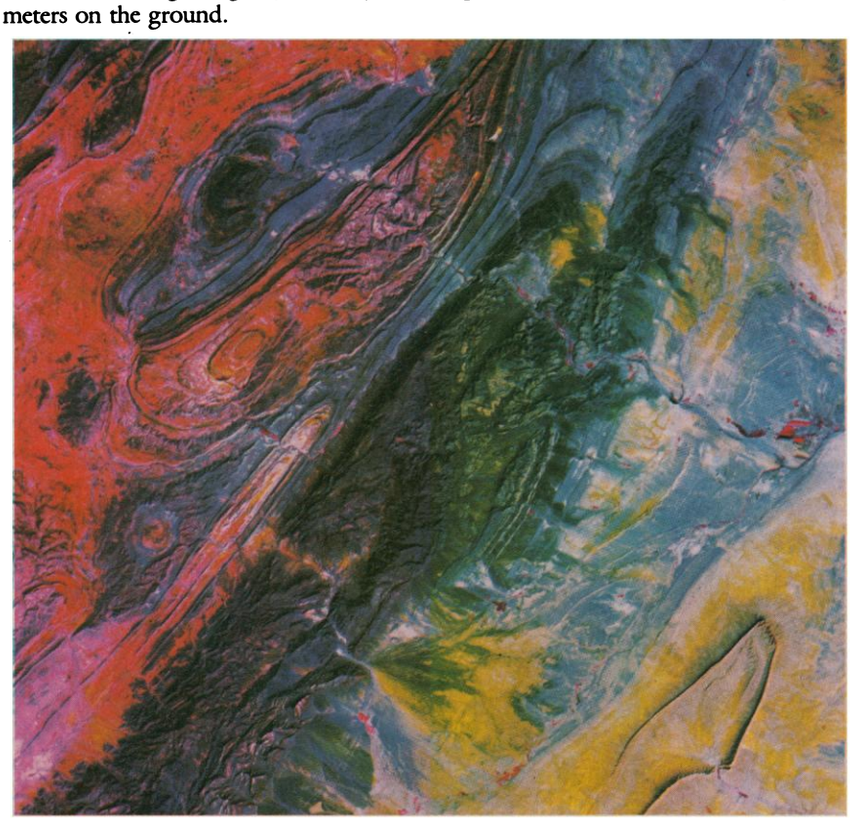
First Image from SPOT

On the evening of 21 February, the remote sensing satellite SPOT-1 was launched from Kourou, French Guiana, aboard the European Space Agency's Ariane rocket. Two days later it acquired the scene shown here as it passed over the Atlas Mountains in northern Algeria. The image clearly shows the tortuous geology of the area, and uses false color to highlight the various rock types. The northeast-trending ridges are hard sandstone, for example, while the yellow, fan-shaped areas are alluvial sands washed down from the mountains. Agricultural activities along the major wadis and streams show up as small red patches.

The launch of SPOT dramatizes the emergence of space remote sensing as a vigorous commercial enterprise. Images such as these will be marketed on a worldwide basis by SPOT Image, which is a venture of CNES, the French national space agency, together with 18 other public and private institutions in France, Belgium, and Sweden. The images themselves cover four spectral bands in the visible to near infrared wavelength region, and they offer a spatial resolution of 10 meters by 10 meters on the ground.



In the United States, meanwhile, the Earth Observation Satellite Company (EOSAT) of Landover, Maryland, has recently taken over commercial operation of Landsats 4 and 5, which were originally built and launched by the National Aeronautics and Space Administration. EOSAT is a joint venture of RCA and Hughes Aircraft. In addition to operating the existing satellites, EOSAT is planning a polar orbiting platform known as OMNISTAR to be launched by the space shuttle in late 1988 or early 1989—assuming, of course, that the shuttle will be flying again by then. Not only will OMNISTAR hold a wider variety of sensors than a conventional spacecraft, but with a design lifetime of 20 years it will last three to four times as long. Visiting shuttle astronauts will repair and upgrade the instruments as needed. EOSAT's agreement with the government calls for a $250-million federal subsidy during its first few years as it attempts to make the remote sensing business self-supporting. The White House zeroed out that appropriation in this year's budget request. However, Landsat commercialization has considerable support on Capitol Hill, and the company expresses confidence that Congress will put the money back in. ■ M. MITCHELL WALDROP

Briefing:

AIDS Drug Shows Promise in Preliminary Clinical Trial

A drug that disrupts the life cycle of the AIDS virus has shown promise in an early clinical trial.* Nineteen patients, who either had AIDS (acquired immune deficiency syndrome) or had symptoms suggesting that they were developing the disease, were given AZT (3′-azido-3-deoxythymidine) for 6 weeks. The primary goal of the trial was to determine whether AZT could be given to patients without causing unacceptable toxicity—and that appears to be the case. In addition, the results suggest that the patients' conditions improved somewhat while they took AZT. Nevertheless, study coordinator Samuel Broder of the National Cancer Institute cautions, "A 6-week study is not adequate to draw any conclusions about clinical efficacy."

The AIDS virus, which is called both human T-cell lymphotropic virus III (HTLV-III) and lymphadenopathy-associated virus (LAV), causes a severe immune depression by infecting, and eventually killing, the helper T cells needed for mounting many immune responses. The virus has an RNA genome that is copied into DNA in infected cells by a viral enzyme. AZT blocks this because cells convert the drug to a substance that resembles a normal DNA building block. The viral enzyme can add this substance to the growing DNA chain, but AZT's structure then prevents the addition of further building blocks, thereby interrupting the life cycle of the AIDS virus.

Although AZT, with its ability to terminate DNA synthesis, might have been expected to produce intolerable side effects, they proved to be relatively mild, as least during the short course of this trial. They included headaches and decreases in the white and red blood cell counts of the patients. No patients died of drug-related causes, but one dropped out because of a possible adverse reaction to AZT.

AZT's side effects may have been less severe than had been feared because the enzyme that synthesizes cellular DNA is more resistant to the drug than is the enzyme that synthesizes the viral DNA. "It is not as easily fooled into putting AZT into DNA," Broder explains. He notes that Jerome Horwitz of the Michigan Cancer Foundation in Detroit synthesized AZT in

*R. Yarchoan *et al*, *Lancet* **1986-I**, 575 (1986).
†H. Mitsuya and S. Broder, *Proc. Natl. Acad. Sci. U.S.A.* **83**, 1911 (1986).