

SCIENCE & TECHNOLOGY

Space Shuttle Skeptics

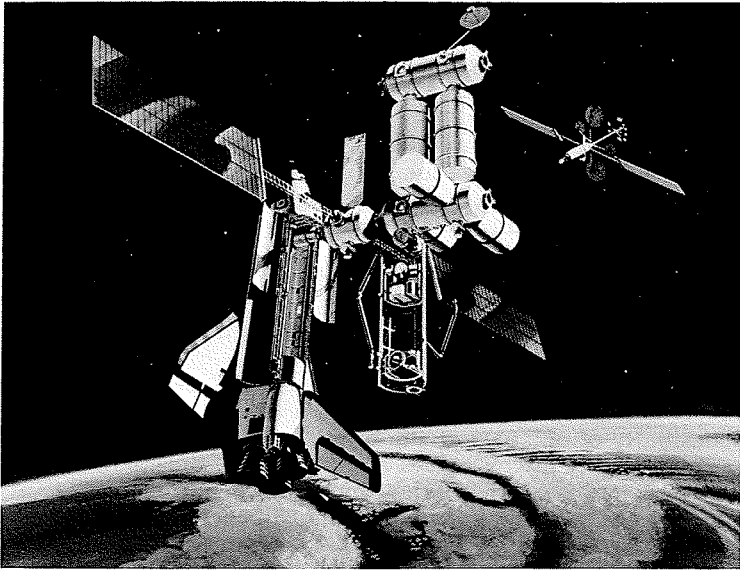
"Spacelab: Science on the Shuttle" by M. Mitchell Waldrop, in *Science* (Oct. 28, 1983), 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

After 13 missions, U.S. space shuttle launches still capture the public imagination sufficiently to merit live network TV coverage. But not everybody is cheering.

To scientists, reports Waldrop, a *Science* correspondent, the shuttle represents unmet expectations. During the early 1970s, the National Aeronautics and Space Administration (NASA) promised scientists that there would be 20 shuttle flights yearly as early as 1982, with plenty of room for their experiments. The European Space Agency (ESA), a consortium of 14 European nations, spent nearly \$1 billion to develop the reusable Spacelab, which first flew in *Columbia's* cargo bay in late 1983, and made plans for four all-European Spacelab missions. Meanwhile, NASA solicited designs for 40 major Spacelab projects from U.S. scientists.

But a series of cuts in NASA's budget since the mid-1970s has forced a major reduction in shuttle flights. NASA has purchased a second Spacelab, but will buy no more; the ESA plans only one all-European mission (paid for by the West Germans and scheduled for 1985). And NASA so far has funded only three of the 40 proposed experiments, leaving a "bitter, suspicious community of space scientists," says Waldrop.

At best, Spacelab will be sent aloft about 10 times annually by the



NASA hopes to place a manned space station in orbit by the early 1990s but has not yet settled on a design. Seen here is an artist's conception.

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end of the 1980s. And in all but one or two of each year's flights, the flying laboratory will be automated and unmanned—just another part of the shuttle's cargo. (The shuttle's payload is divided roughly equally among military, scientific, and commercial projects. Virtually all of the commercial uses involve launching communications satellites.)

NASA officials have sought to soothe the scientists. They say that the remaining 37 experiments will eventually get berths on the shuttle. On the waiting list are experiments in biology, astronomy, and materials research (e.g., growing silicon crystals in zero gravity).

But the shuttle is far from an ideal platform for scientific experiments. "It vibrates, it emits vapors and exhausts, it glows ever so slightly in the dark," notes Waldrop. A permanent orbiting space station would not suffer such drawbacks. But according to Waldrop, scientists' disillusionment with the shuttle was a "major factor" in a National Academy of Science panel's recent repudiation of NASA's tentative plans to launch such a station by the early 1990s.

Born-Again Diseases

"Are New Diseases Really New?" by Edwin D. Kilbourne, in *Natural History* (Dec. 1983), Membership Services, P.O. Box 6000, Des Moines, Iowa 50340.

The world's last remaining pockets of smallpox had hardly been wiped out when a series of baffling new illnesses—Legionnaires' disease, toxic shock syndrome, and, most recently, AIDS (acquired immune deficiency syndrome)—seemed to materialize out of nowhere.

Most of these afflictions are actually old diseases given new life by man-made changes in the environment, explains Kilbourne, a Mount Sinai School of Medicine microbiologist.

The poliomyelitis scare during the first half of the 20th century grew, ironically, out of improved sanitary conditions that cut infant mortality and thus exposed more youngsters and young adults to the disease. Likewise, toxic shock syndrome is probably caused by a change in women's hygiene, namely the use of new high-absorbency tampons, which seems to nurture common staphylococcal bacteria.

The comforts and fashions of 20th-century living have also taken their toll. The outbreak of Legionnaires' disease that killed 29 people in a Philadelphia hotel in 1976 has been provisionally blamed on a bacterium that can flourish in unclean air-conditioning systems. Today's exercise craze has sparked its own plagues—such as tennis elbow.

As for AIDS, one hypothesis suggests that it is caused not by a mysterious new agent but by repeated sexually-transmitted infections of the common cytomegalovirus.

Is our quota of misery constant? Sometimes it seems so. A physician who can cure blindness by performing a cornea transplant can find that he has also transplanted the donor's latent brain-destroying Creutzfeldt-Jacob disease. But Kilbourne finds room for optimism. Some of man's worst mass scourges—typhoid fever, smallpox—are behind him. No disease that has surfaced lately threatens such devastation.