

## SCIENCE, TECHNOLOGY & ENVIRONMENT

### *The Fetal Patient*

“The Littlest Patient” by Dario O. Fauza, in *The Sciences* (July–Aug. 1999), New York Academy of Sciences, 2 E. 63rd St., New York, N.Y. 10021.

Surgeons in recent decades have acquired a new patient: the fetus. The risks of fetal surgery are great, but so is the ultimate promise, says Fauza, a pediatric surgeon at Children’s Hospital in Boston.

“Only about 200 fetal surgeries have been performed so far on human beings,” he writes, “and the results have been tantalizing, but disappointing as well.” Of some 120 fetuses operated on in the last two decades at the University of California, San Francisco—which is one of two major fetal surgery centers in this country, along with the Children’s Hospital of Philadelphia—only about half the babies survived; lately, though, the success rate has been closer to 75 percent. “Fetal surgeons,” says Fauza, “have treated such potentially fatal defects as a hole in the diaphragm, which can prevent the lungs from developing adequately, and an obstruction of the urinary tract, which can destroy the kidneys. And the day may not be far off when more intricate operations, such as open-heart surgery and even liver transplants, will be performed inside the womb.”

For most of medical history, the fetus was largely a mystery. Not until the 1960s were the first tentative efforts at human fetal surgery made. In 1963, two Columbia University obstetricians performed a blood transfusion on a fetus suffering from fatal anemia. While the open surgery was technically a success, the baby was born prematurely and died. However, that same year, a New Zealand obstetrician, addressing the

same sort of fetal problem, used a needle guided by X-rays instead of open surgery, and the baby survived. Two years later, in San Juan, Puerto Rico, the first open fetal surgery in which the child survived was performed. It remained an isolated success, however, as most subsequent attempts failed.

Interest in fetal surgery revived in the late 1970s, when prenatal ultrasound became commonplace, letting physicians observe the unborn in the womb. In 1981, a pediatric surgeon at the University of California, San Francisco, introduced open fetal surgery to treat severe blockages of the urinary tract. Then, in the early 1990s, videofoscopic surgery was introduced, in which the lens of a video camera is inserted into the uterus through one of several small incisions, enabling the surgeon to see the fetus on a screen while carrying out the operation through the other incision(s).

Fetal surgery, however, is still relatively dangerous to the pregnant woman, who risks hemorrhage, or lung or kidney failure. Because of that, Fauza says, such surgery “is undertaken only when the fetus’s life is imperiled, and only if there is little chance that the mother’s fertility will be compromised.” As the techniques become more refined, he says, success rates will increase and the strain on the mothers will lessen. Eventually, he believes, fetal surgery will allow “most birth defects to be repaired in an optimal way.” Inasmuch as three percent of newborns today have major birth defects, that will be no small advance.

### *The Empire of Science*

“A View from the Bridge: The Two Cultures Debate, Its Legacy, and the History of Science”  
by D. Graham Burnett, in *Daedalus* (Spring 1999), Norton’s Woods, 136 Irving St.,  
Cambridge, Mass. 02138.

Forty years ago, British novelist and former physicist C. P. Snow (1905–80) decried the chasm separating “the two cultures,” scientific and literary, stirring up tremendous controversy on both sides of the Atlantic. The disjunction Snow posited is still “regularly lamented in

scholarly symposia, cited by academic administrators, and invoked to help account for everything from the ‘science wars’ to the history of environmental policy,” observes Burnett, a historian of science at Columbia University. Unfortunately, he contends, the “Snowian dis-