

in? And what comes first when the Church faces hostility in the Third World: "inculturation" of democratic norms, or

of the faith? Such questions, Weigel says, insure that the Church's intellectual struggle with democracy will continue.

SCIENCE & TECHNOLOGY

Cosmic Anarchy?

"Through the Looking Glass" by George Greenstein, in *Astronomy* (Oct. 1989), 21027 Crossroads Circle, P.O. Box 1612, Waukesha, Wisc. 53187.

Is our universe only one among many? Is it theoretically possible to create a new universe in a laboratory—from 20 pounds of chopped liver?

Not long ago, scientists would have scoffed at such questions. Now, reports Greenstein, an Amherst astronomer, astrophysicists and others have begun taking them seriously because of the work of an MIT physicist named Alan Guth.

In 1981, Guth formulated a new theory that explained certain nagging gaps in the half-century-old Big Bang theory of the origin of the universe. Suppose that during the Big Bang the expanding universe suddenly underwent a quantum "inflation" far greater than hitherto imagined, and in the space of only 10^{-34} seconds. Drawing on the highly speculative "grand unified theory of particle physics," Guth suggested that during the Big Bang, the expanding (and cooling) universe experienced a sudden vast release of energy, just as water vapor releases energy when it cools and

becomes liquid. That would cause Guth's "inflation." It would also explain the origin of matter. All of that energy would not merely dissipate after inflation, Greenstein explains, but would be transformed via Einstein's famous equation, $E=mc^2$, into matter: "Lots of matter."

That is why a new universe might, in theory, be created out of a tiny "seed" (the 20 pounds of chopped liver, or anything else) subjected to powerful forces.

It also suggests that nature may regularly create new universes, which stream outward from ours like "bits of fluff blown from a dandelion in spring." Or that our universe is a bit of fluff from an earlier one. These other universes could be ordered on completely alien principles. For example, they may be built without atoms. We might perceive these parallel universes only as "black holes" in space.

Finally, Guth's theory raises the possibility that, if "inflation" occurred unevenly during the Big Bang, even the far reaches

Onward to Mars!

In *Harper's* (Aug. 1989), the poet Frederick Turner proposes a modest cure for the malaise of affluence.

We need a project that will allow us to pursue beauty and truth on a grand scale—a vision as "impractical," "wasteful," "impossible" as the cultivation of Mars. The most stable and perhaps the most contented society in the world, I would say, has been that of ancient Egypt, which for thousands of years poured its surplus wealth straight into the ground, in the form of grave goods, tombs,

and monuments. What was more impractical, wasteful, impossible than the pyramids? . . . How are we to employ the beautiful and terrible heroic spirit of humankind, ready for suffering and sacrifice, when we no longer have war and nationalist myth to spend it on? How are we to use those billions of dollars and rubles, which employ millions of workers and serve as a fiscal and technological flywheel, to keep the economy going? Garden Mars! The enormous scale and expense of such a project can, in this light, be seen as one of its great advantages.

of our own universe might be ordered on different principles. If so, the laws of physics are not truly universal.

All of this is purely speculative, Green-

stein cautions. But even if Guth is wrong he has moved us forward to "a great juncture in the evolution of our ideas about the cosmos."

A New Andromeda Strain?

"The VIRAL Advantage" by Rick Weiss, in *Science News* (Sept. 23, 1989), 1719 N St. N.W., Washington, D.C. 20036.

What if the AIDS virus could spread as easily as the common cold?

That horrifying possibility is not ruled out by medical researchers, reports Weiss, a *Science News* correspondent. Viruses have recently been found to possess an alarmingly high propensity to mutation—once in every 10,000 replications. In 1983,

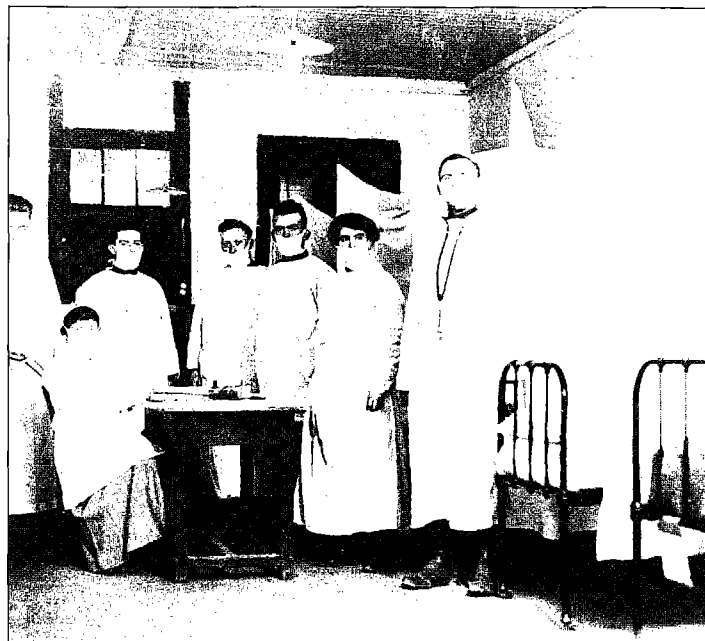
Tenn. "There are millions of us 'chickens' just waiting to be infected." (The AIDS virus, which has infected five to 10 million people worldwide, was apparently once carried only by African monkeys.)

Far more common than mutation, but every bit as threatening, is the spread of existing viruses from hitherto isolated lo-

cales. Recently, for example, Lassa fever erupted in Nigeria after a "diamond rush" in the interior put humans in contact with a virus-carrying mouse. During the 1960s, several West German polio researchers died from a mysterious disease that caused bleeding and blood clots. The reason: They had been working with Ugandan monkey cells infected with a previously unknown organism now called Marburg virus. In 1977, Rift Valley virus jumped from South African sheep and cattle, its usual hosts, to humans. Making its way to Egypt, it infected millions of people and killed thousands.

Bearing everything from new strains of the flu to AIDS, viruses continue to

confound scientists. They are not at all certain that they can contain new viruses in the future. They do agree on one thing: More research laboratories are needed in the tropical countries where new outbreaks most frequently occur. With these "listening posts" and proper planning, Weiss says, medical researchers might be able "to nip the next Big One in the bud."



The great "Spanish flu" influenza epidemic of 1918-19 claimed 20 million lives worldwide, including 500,000 in the United States.

a benign virus present in chickens mutated into a deadly avian influenza in a Pennsylvania poultry farm. Before the epidemic ended six months later, 17 million chickens were dead. "The [1983] chicken population in Pennsylvania is like the world as it is in this moment," warns Robert G. Webster, a virologist at St. Jude Children's Research Hospital in Memphis,