Science at the AAAS

From our reporters in San Francisco at the annual meeting of the American Association for the Advancement of Science

Marshallese: Delayed thyroid problems

When the United States detonated a thermonuclear device at the Bikini Atoll on March 1, 1954, an unexpected shift of winds blew radioactive fallout onto the Marshall Islands to the east. Before the entire, exposed population of Marshallese could be evacuated (in two days), the estimated whole-body gamma doses on the three atolls were: Rongelap (64 persons), 175 rads; Ailingnae (18 persons), 69 rads; Utirik (158 persons), 14 rads.

Since then, researchers at the Brookhaven National Laboratory in Upton, N.Y., have studied the acute and long-term effects on 244 Marshall Islanders accidentally exposed to fallout. During the first 10 years following the accident, few findings were discovered that could be related to radiation exposure. In the second decade, however, "serious, late effects developed related primarily to the thyroid gland," says Hugh S. Pratt of Brookhaven. Nodules of the thyroid gland began to develop in Rongelap children, and to a lesser extent in adults, beginning about nine years after exposure, the Brookhaven team reports. In the more than 15 years since then, the researchers have discovered benign nodules in 34 exposed patients and cancer "of low grade malignancy" in seven other exposed patients.

Suspecting the possibility of hypothyroidism in other individuals exposed to less radiation than those who developed tumors, the researchers initiated a series of studies in 1974 on previously unoperated, exposed Marshallese. In the Rongelap population and a control group, they measured the serum TSH elevation — the most sensitive index of impaired thyroid function — and response to hormones that release thyrotropin (a hormone that stimulates the thyroid).

"The present studies suggest that there is a significant risk of development of impaired thyroid function many years (20 to 25) following estimated thyroid doses of less than 350 rads from the ... radiation present in fallout from nuclear detonations," Pratt reports. "In the Rongelap and Ailingnae group, the effect has apparently not been significantly severe to result in clinically evident hypothyroidism, but by currently acceptable criteria there is evidence of impaired thyroid reserve in a few of these individuals. If they are left untreated, it is expected that thyroid function will continue to decrease to the point of clinical hypothyroidism."

The data also indicate that the frequency of elevated serum TSH — the earliest biochemical evidence of impaired thyroid function — is also significantly more common among the Rongelap population than in the unexposed comparison group, the researchers report.

Escalation to mouse with eight parents

Merger of mouse embryos has created a mouse of too many colors, reports Clement L. Markert of Yale University. A four-colored, octaparental animal tops the three-colored, hexaparental mouse named "Sixi," which developed from the combination of three embryos more than a year ago (SN: 10/14/78, p. 261). Sixi has by now produced yellow, black and white offspring, demonstrating that cells derived from all three of the original embryos contribute to the germ cells as well as to the coat. Sixi was considered to be evidence that three cells from the early embryo develop into the fetus; other cells become placenta, yolk sac and other extraembryonic structures. However, the birth of a mouse with eight parents has not convinced scientists that four cells normally participate in fetus development. Statistical analysis of data obtained in many other embryo merger experiments doesn't fit a four-slot model, Markert says. He believes that in the merged embryos, which have an abnormally large inner cell mass, there is an increased chance for cells to participate in fetus development.

Inflation from too much money

As inflation chugs along at double-digit rates, reducing purchasing power and eating away at savings, smoldering arguments among economists over its causes have burst into open flame. On one side are "wage-push" theorists who argue that events like wage increases or the rising price of oil are the main culprits. On the other side, "monetarists" argue that unwise expansion of the money supply is to blame. But now there is new evidence favoring the views of the monetary theorists.

Michael Bazdarich of the Federal Reserve Bank of San Francisco presented the results of his study of long-term, systematic inflation trends for the past 20 years. He concluded that about 70 percent of fluctuations in the quarterly consumer price index can be explained in terms of money growth alone. Conversely, monetary variables were not affected by rising costs.

"Wage and commodity price increases are typically responses to inflation, rather than causes of it *per se*," he says. "Therefore, general wage and price controls, or even guidelines, will treat only the symptoms of the inflation, usually to the detriment of all parties concerned, while doing nothing about the systematic nature of the problem itself."

Other speakers echoed these conclusions. Michael R. Darby of the University of California at Los Angeles studied the effects of international factors on U.S. inflation and found them to be short-lived and self-reversing. Paul Evans of Stanford University said that the actual social costs of inflation are further worsened by the government's unwillingness to adjust tax rates and interest ceilings for shifts in income and prices.

Lagoon life of a gray whale

The lagoons along the coast of Baja California must be protected in order to preserve the gray whales, says Kenneth S. Norris of the University of California at Santa Cruz. The lagoons may explain in part how these whales have come back from near extinction. The shallow inner regions of the lagoons are reserved for females with calves. The lagoon entrance is populated by single males, females and juveniles. Although the whales had been thought to eat only in the Arctic, Norris suggests that the entrance group is feeding much of the time. Tides going through the narrow channel twist the water and concentrate plankton and crabs, and Norris observes whales surfacing with water flowing from their mouths. The other entrance activity seems to be courtship. If the whales with calves were not safely situated back in the lagoon, the chasing and thrashing might separate calves from their mothers. When the singles leave the lagoon for their northern migration, females with calves move into the entrance until they too head north about a month later.

Cults vs. organized religion

Although many Americans have forsaken traditional organized religion, the reason has not been that they are becoming more secular or have lost their spiritual needs, conclude two University of Washington sociologists. Rather, say Rodney Stark and William S. Bainbridge, the "unchurched" have mainly sought new outlets for these needs through cults.

To bolster their argument, Stark and Bainbridge show that cults thrive particularly in those states (such as Washington) where church membership is lowest and are weak in those (like Utah) where it is highest. The shift, they suggest, comes when people forsake churches that make claims science can disprove. The problem is, "many of the new religions are much more magical than the churches ever were," Stark says. "They are dead ends." So, of the new cults, the authors conclude, "We don't see any that look likely to become the next major religions."