

"didn't locate and examine the carcasses of their livestock," says Dede Armentrout of the Brownwood, Tex., National Audubon Society. "It's like sending out a questionnaire to people asking how many quarters they lost in a Coke machine last year," she says.

Also at issue is whether results of research conducted since 1972 could lessen the potential hazards and nonselectivity of 1080 use. Proponents of 1080 point to the research programs on a new delivery mechanism—a toxic collar worn by sheep around the neck where predators are likely to attack. Opponents of 1080, however, counter that the collar can be easily punctured by barbed wire, cactus and bushes, that animals can chew through their own collars and that predators can attack from the rear and not be poisoned.

These and other considerations now sit in the lap of an EPA review panel. The panel hopes to decide by mid-September "whether there is substantial new evidence concerning the risks and benefits of using 1080" that would warrant initiating hearings to consider lifting the ban. □

Pinpointing problems in test-tube tots

For a handful of childless couples, test-tube baby technology has triggered the births of healthy offspring, but "despite these truly remarkable achievements, the rate of success is disappointing," says the chief of the pregnancy research branch at the National Institutes of Health in Bethesda, Md.

Reporting in the Aug. 7 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, Gary D. Hodgen pinpoints some of the problems that keep the sperm and egg in a laboratory dish from becoming a thriving tot. He also introduces a few alternatives to test-tube fertilization (including a tiny incubator stitched just outside the mother's uterus) that may eventually bring children to more of the estimated 500,000 U.S. women now infertile because of blocked or diseased fallopian tubes.

Far more than a simple transport pipe linking ovary to uterus, each fallopian tube provides a rich, variable milieu of nutrients and gases necessary for timely development of an embryo. Damage to the tubes often prevents fertilization. Researchers trying to get around the problem can successfully combine egg and sperm outside the body, but they can't yet replicate the ingredients and environment of the fallopian tube.

The study conducted by Hodgen and Olivier Kreitmann at NIH showed that "monkey embryos developing *in vitro* kept pace with the expected time course for only about 24 hours." Because the mother's reproductive hormones work together with the fertilized egg to synchronize each step in development, a

test-tube embryo's sluggish growth might be enough to desynchronize the system and prevent implantation, they say.

While scientists continue to search for the ingredients needed to nurture a test-tube embryo, Hodgen suggests a supplement to *in vitro* fertilization that might work for women with partially intact tubes. He and Kreitmann surgically blocked the fallopian tubes of 31 rhesus and cynomolgus monkeys near the ovary. By moving a ripe egg just past the blocked portion of the tube and permitting normal fertilization through intercourse, the researchers realized a 16 percent yield of apparently healthy infants — the same success ratio achieved through intercourse by couples with no blockage problems.

To possibly permit pregnancy in women who completely lack fallopian tubes, the team developed prototypes of an "egg-embryo chamber," a one-inch-long plastic container that could be temporarily anchored in the abdominal cavity for the nine days an embryo would normally spend in the fallopian tube. The peritoneal fluids that flow through the chamber, bathing the egg, seem to foster a normal growth rate, Hodgen says, though none of the monkey eggs fertilized in such chambers have yet been implanted in a uterus. At least two more years of research in animals are needed, Hodgen estimates, before testing of the egg-embryo chamber in women might begin. □

Adler on Nijinsky: Preface suppressed

His genius laced with madness, Vaslav Nijinsky bounded from the heights of dance stardom in 1917 to the depths of schizophrenic isolation. When the world couldn't meet his highest expectations, the Russian dancer began to doubt himself and covered his feelings of inferiority with a cloak of Messianic strivings. Or so writes psychoanalyst Alfred Adler in his preface to the artist's diary, God Nijinsky. First published in the July ARCHIVES OF GENERAL PSYCHIATRY, the preface was suppressed for more than 30 years because Romola Nijinsky rejected a less than glorious analysis of her husband.



Nijinsky in Peirouchka, 1911/The Bettmann Archive.

The universe: Still an open question

Combined studies of high energy physics and cosmology are providing a clearer vision of our universe as an infant, a seething, largely unorganized world of elemental particles. Of special interest to scientists and the authors of a paper in the June 15 *ASTROPHYSICAL JOURNAL* is the three-minute-old universe. At about that stage of things, freshly fused lightweight nuclei like lithium-7, hydrogen-2, helium-3, but particularly helium-4 began further coalescing to form the known elements.

In a synthesis of their own making, the authors, from the universities of Chicago and Delaware, culled from the professional literature the most recent values of certain key parameters that are now thought to have governed the universe's period of nucleosynthesis. Their wide-ranging conclusions seem generally to corroborate other evidence that our universe will expand outwardly without end, and also that at least one more (a fourth) species of neutrino exists than is now acknowledged by particle physicists.

Those few minutes leading to nucleosynthesis billions of years ago implicate modern theories of elementary particles, most notably quantum chromodynamics, and the standard (big bang) model of cosmic evolution. Various parameters endemic to each of those separately are now seen as brought together by the "multidisciplinary" process of nucleosynthesis. Four of them are singled out in the paper for their special physical significance: the lifetime of the neutron; the ratio of total baryon (a major class of strongly interacting particles, including principally the neutron and proton) and photon populations of the universe; the number of existing neutrino species (known are the electron and muon species; the tau is not confirmed, but generally accepted by particle physicists); and the fraction of the universe's mass that is helium-4.

In their paper, K. A. Olive, D. N. Schramm, Gary Steigman, M. S. Turner and J. Yang set out to evaluate the current data in search of the most likely values of those four parameters. Not unexpectedly, prevailing uncertainties force them in each instance to consider not any one value of the parameter, but a likely range of values. Interestingly, all but one of the possibilities encompassed by the uncertainties lead to our universe being open. One of the major possibilities that could intrude into their analysis and decisively alter that conclusion is the existence of massive neutrinos (the tau neutrino may turn out to be an example). These hypothesized mutations of an "idealized" neutrino have a rest mass, which if large enough—a few hundred-thousandths of an electron mass or so—could increase the universe's total mass density. Enough, even, to close it. □