that a statute be judged unconstitutional on this second prong of the three-pronged test it has to be demonstrated that advancement of religion is the primary effect of the act. In other words, if creation science were judged to be science, then the act would not fall on this test. Overton devotes 13 pages of his 38-page decision to demonstrating that, in his opinion, creation science is not science.

The definition of creation science presented in the act has six parts. The first refers to the sudden origin of the universe, energy, and life. "Such a concept is not science because it depends upon a supernatural intervention which is not guided by natural law," Overton writes. "It is not explanatory by reference to natural law, is not testable and is not falsifiable." The decision states that if the "Unifying idea of supernatural creation by God is removed [from this item], the remaining parts [of the definition] explain nothing and are meaningless assertions."

The second part of the definition relates to the "insufficiency of mutation and natural selection in bringing about development of all living kinds from a single organism." This, according to the opinion, "is an incomplete negative generalization directed at the theory of evolution."

Section three refers to "changes only within fixed limits of originally created kinds of plants and animals." This is not science, says Overton, because no one is able to define "kind" and there is no rational explanation of the limits mentioned.

Section four describes "separate ancestry of man and apes." This is "a bald assertion" which "explains nothing and refers to no scientific theory or fact."

Section five refers to "explanation of the earth's geology by catastrophism, including the occurrence of a worldwide flood." Overton has no doubt that the flood mentioned is Noah's: "[it] is not the product of natural law, nor can its occurrence be explained by natural law."

The last section, which claims a "relatively recent inception of the earth and living kinds," is dismissed as having no scientific meaning. "It can only be given meaning by reference to creationist writings which place the age at between 6,000 and 20,000 years because of the genealogy of the Old Testament," states Overton.

Creation science not only does not fit the definition of scientific theory, Overton says, but it also "fails to fit the more

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Goyan Sees Risks in Academic Drug Ventures

"Universities ought to stay the hell out of those enterprises," said Jere Goyan, the former commissioner of the Food and Drug Administration (FDA), speaking of the fad in academia to create quasi-commercial institutions to develop new products using the technology of gene splicing.

Goyan, who headed the FDA in the last days of the Carter Administration, is now dean of the School of Pharmacy at the University of California at San Francisco. He spoke on 6 January at the AAAS meeting on the probable impact of federal regulation on new drugs produced by genetic manipulation.

These drugs will present many of the same regulatory dilemmas that conventional drugs do, Goyan said. But they may present one new problem as well. If the universities become heavily involved in patenting and exploiting this technology, they will forfeit their role as independent advisers.

According to Goyan, academic pharmacologists already tend to identify with the drug industry's point of view. It will be far more difficult to find independent reviewers if universities have a financial stake in drugs proposed for licensing. "We must not forget that universities are bureaucracies, too," Goyan said. It could become difficult for academics to speak frankly about a proposal in which the university has invested its name or its capital. The FDA, which relies on outside expertise in making licensing decisions, may have trouble finding consultants who do not have a conflict of interest, he predicted.

On a separate subject, Goyan said that he was very discouraged by the FDA's recent decision to scrap an experiment intended to help educate the public about drug use. On 22 December, the FDA announced that it would not carry out a pilot project requiring manufacturers of ten high-risk drugs to include leaflets known as patient package inserts (PPI's) along with prescriptions. The leaflets would have provided basic information about the drug's uses, side effects, and limitations. The FDA's original plan was to require PPI's in every drug package. When he was FDA commissioner, Goyan encountered strong opposition to the plan from drug manufacturers, doctors, and pharmacists. As a compromise, he adopted a pilot program that would have required that the PPI's be used only for ten drugs. Among those included were an ulcer drug, an antibiotic, pain-killers such as Darvon, and tranquilizers such as Valium.

In canceling the pilot program, Goyan said, the FDA has surrendered abjectly to pressure from the drug and medical lobbies. He was particularly discouraged by the opposition of his professional peers, the pharmacists. Goyan had hoped that they would side with the consumers in this case, asserting their independence from the drug producers. Goyan expects that the voluntary patient education programs which will be substituted for the PPI program will fade away without having much impact.

—Eliot Marshall

Ethicist Approves Test-Tube Baby Research

A Georgetown University ethicist thinks there is no reason not to go ahead with research on human in vitro fertilization and embryo transfer to the mother's womb.

LeRoy Walters, director of the Center for Bioethics at the Kennedy Institute of Ethics, told a symposium at the AAAS meeting that he did not see any ethical problems with the procedure. First of all, he said that in its clinical application "there is no need for a consensus on the moral status of the early embryo" because no normal fertilized embryos are discarded in either of the two existing approaches that have been used. "The only morally relevant difference between in vivo and in vitro methods is that in the laboratory the clinician can examine each early embryo for abnormal development." He said that a decision not to transfer a grossly abnormal embryo "is not qualitatively different from a decision not to employ extraordinary means to prolong the life of a newborn infant" with serious birth defects.

Walters identified two other primary ethical issues: the risks of the proce-

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