School, the U.S. model code will legalize 15 percent of the abortions that are now illegal, leaving thousands, perhaps a million, abortions yearly in the criminal category.

There is a "deep and abiding instinct" in this country to make things criminally offensive and to imbed moral codes in criminal law, says Dr. Manning. The two are just not the same. Unless a criminal statute is backed by a central core of solid, public support and practice, "you get exactly what you've got in the case of abortion," he says. "When an entire community is operating a still, revenuers have a difficult time."

Dr. Manning's implicit suggestion that abortion be removed from the criminal law is finding an unexpected reception in Catholic quarters. Some priests at the conference expressed a willingness to see all laws withdrawn and abortion made a matter of conscience.

"There is an argument to be made," says Father Robert F. Drinian, Dean of Boston College Law School, "that law should withdraw from this area altogether." In his opinion, only two choices are open—current strict prohibitions in which the only cause for abortion is to save the mother's life, or no laws at all governing abortion during the first 26 weeks of gestation (abortion is generally not possible after 26 weeks).

Any grounds between those extremes get the state into the business of deciding who shall live.

In fact, one of the main Catholic attacks during the conference centered on the issue of the defective fetus. Warnings such as "if this class of people can be done away with, where will it stop?" were common. "Why not wait and see" if the child is defective before "exterminating him?" asked one participant, a California law professor.

In an emotional address to the conference, Mrs. Sargent Shriver, sister to the late President Kennedy, raised a nightmare vision of an "institute of death—an institute where experts of no race, creed or color would scientifically determine who has the right to live, where and for how long."

"Does this sound like a bad dream? . . . It is already a visible preview of the world to come."

Mrs. Shriver acknowledged that one of the conference's aims was to reapply moral and theological opinion in areas increasingly left to scientists—such as abortion.

Not surprisingly, many observers called the meeting male-dominated and slanted toward the prevailing Catholic antiabortion position. There was truth to both charges. Religious bias was evident in the careful selection of the 48 invited authorities. Both representatives from England for instance, were strong opponents of their new law, which most closely resembles the U.S.'s. The only invited geneticist eloquently opposed abortion on the basis of a possible defective fetus. "In no way can we judge that a given manifestation of life should not appear," said Dr. Jerome Lejeune, well-known French geneticist.

Finally, the social sciences were underrepresented—several participants in those fields came from religious schools or backgrounds.

Ironically, the conference may have served to crystalize some liberal opinion. "I didn't realize I was in favor of open abortion laws, until I sat down to write my paper," said Dr. Natalie Shainess, psychiatrist and lecturer at the Columbia College of Physicians and Surgeons.

Women were obviously clearly underrepresented—only three of the 48 were women— but for a reason. Few women hold academic posts in any of the disciplines represented—medicine, law, the social sciences and theology, and the sponsors simply could not find enough eminent females to balance debate. ◈

16 PAPERS ON MOSSBAUER

Test Techniques Emerge for Chemists

Chemistry has entered an age of instrumentation; the number of new instruments designed to measure chemical properties is burgeoning, as seen at the annual convention of the American Chemical Society in Chicago last week.

One analytical method just coming into its own is the so-called Mossbauer effect, which uses the characteristics of radioactive material to determine chemcal conditions around the nucleus of a test atom. Some 16 papers were presented at Chicago dealing with the results of Mossbauer analysis alone.

The Mossbauer effect concerns the gamma radiation put out by radioactive nuclei; the gamma rays come out at a level of energy which depends upon the chemical environment—the kind of molecule in which the radioactive atom is bound. As a test technique, it depends on the relationship between emitted and absorbed radiation.

The gamma rays can be absorbed by atoms in another substance, but only if the absorbing atom has the same energy level characteristics as the source.

Radioactive gold mixed with platinum, for instance, gives off gamma rays at an energy level that an absorber made of gold cyanide can't accept.

But if the radiation source is physically vibrated, the energy of the gamma rays given off is increased. At a particular frequency of vibration the gamma rays will have just the right energy to be accepted by the absorber. Then, if a gamma ray detector is located behind the absorber, the detector will show a low point at that frequency.

From the frequency of vibration, chemists can tell the added energy needed to match the absorber's level, and from this they can deduce the density of electrons near the nucleus and the magnetic and electric fields at the nucleus.

The Mossbauer effect is useful only for atoms that can be made radioactive, which somewhat limits its application.

Another tool, applicable to all elements, is photo-electron spectroscopy, a technique developed by Dr. Kai Siegbahn of the University of Uppsala, Sweden.

In this process, samples are irradiated with X-rays having enough energy to break loose electrons from the inner rings of the sample atoms. The binding energy of the electrons depends on the chemical environment of the atom.

The amount of energy added by the X-rays, which is known, goes partly to free the electron, overcoming the binding energy, and partly to accelerate the electron once it is freed.

To compute what the binding energy is, then, the energy of the electron has to be measured, and this is done by using an electron spectrometer.

According to Dr. David A. Shirley, of the University of California's Lawrence Radiation Laboratory, who reported on the method, one thing that has held it up is the lack of electron spectrometers. Most of the few available are at large laboratories and are used to measure very high energy electrons.

But, he said, for the photo-electron work the energy levels are much lower, so smaller, cheaper machines can be built and used.

Dr. Shirley also described a nuclear effect recently observed in niobium which could be used to determine some chemical qualities of that element and others.

Drs. John Cooper, J. N. Hollander, and J. O. Rassmussen, also of LRL, found that the decay rate of radioactive niobium-90 could be changed by changing the element's chemical environment. Between niobium metal and a complex fluoride compound of niobium, the decay rate differed by as much as four percent.

Since the decay rate was affected by the electron density at the nucleus, and this in turn is affected by the chemical bonding of the compound, the technique is useful in studying the nature of chemical bonds in certain cases. ◈