Hopes Up or Thumbs Down?

Prenatal testing techniques in contemporary obstetrical practice have made it possible to gain a fairly reliable preview of the developing child. There is basis for apprehension, however, that in some cases, the couple might use unfavorable test results as an excuse for exercising an option for abortion or for subsequent sterilization. Another questioning view could be based on the fear that some testing programs might degenerate into mere experimentation, with only secondary concern for the welfare of the infant. Admittedly, such abuses must be rejected as immoral. Before discussing proper motivation for such programs (the "why" of testing), the subject of "what types of tests" should be addressed.

Due to the risks involved, in varying degrees, for each one of the testing techniques, several preliminary observations are in order. First, a risky technique should not be used if the same desired results can be anticipated in the use of an available less risky technique or procedure. Secondly, it would be unjust if a woman had to submit to a risky testing technique at a critical period in her pregnancy due to culpable, professional neglect in the management and monitoring of the pregnancy. Finally, these tests should be administered only by trained and experienced medical personnel. The situation calls for proven expertise.

The Obstetrician's Arsenal of Testing Techniques

1) Pride of place must go to ultrasonography which is the most-used and the least risky of the techniques under consideration. According to the Merck Manual (14th ed., p. 2157), this valuable diagnostic technique is based on "the use of pulse-echo imaging techniques to detect tissue density differences within the body and thus display pathologic processes that are not adequately seen by other diagnostic procedures." Since this unit of equipment does not involve x-rays, and can be moved easily from room to room, it is the diagnostic medium of choice in obstetrical practice. When the barrage of ultrasonic energy (produced at oscillation levels of between 300 and 1000 times per second) strikes a tissue or fluid interface of different density, sonic echoes are reflected back to the transducer face, converted into electrical impulses, amplified, and displayed on an oscilloscope as pips or dots. If the unit is equipped with real-time scanning, whereby a multiple transducer array is interphased successively, it can display motion of the heart, the fetus, and the larger blood vessels without use of contrast media up to 40 frames per second (ibid., pp. 2158, 2159). Truly this is "moving picture" technology.

One medical source describes the advantages of ultrasound as follows:

 Included among its many uses are determining gestational age and presentation, detecting multiple gestations, establishing early fetal life by the detection of fetal heartbeat and movement, diagnosing fetal congenital abnormalities, locating the placenta, monitoring fetal growth and determining well-being by the biophysical profile, confirming fetal maturity, and enhancing parental bonding (Management of High-Risk Pregnancy, John T. Queenan, MD, ed., 2nd ed., 1985, p. 215).

As indicated by the quotation above, ultrasonography is a valuable diagnostic technique even in the first trimester of pregnancy. The same source indicates, however, that the prudent physician should not "guarantee" the safety of ultrasound. This advice is followed by the following statement: "To date, there have been no reports in the literature of harmful

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effects due to diagnostic imaging with commercially available instruments" (ibid., pp. 229, 230).

2. **Amniocentesis** is a procedure whereby a needle is inserted through the abdominal wall into the amniotic sac which surrounds the fetus. A small amount of the amniotic fluid can be withdrawn and used to obtain cells that have flaked off of the body of the fetus into the fluid for diagnostic analysis. The procedure has been used routinely since 1956 when it was demonstrated as a reliable aid in the management of Rh-immunized pregnancy (ibid., p. 201). When used for genetic screening purposes (to detect chromosome abnormalities, metabolic disorders, neural tube defects, etc.) the ideal time is 15 to 17 weeks of gestation when the amniotic fluid volume increases rapidly.

During the second half of pregnancy, amniocentesis is rarely used for genetic purposes, but is useful (during that period) for determining fetal condition in Rh disease or other blood group immunizations, as well as to determine fetal maturity to check for infection and maturity in the setting of the premature rupture of the membranes (ibid., p. 202). The advantages of using ultrasonography in combination with amniocentesis should be apparent (for example, to determine the exact location of the placenta before inserting the needle). Risks are involved. Careful judgment and skill are required. If such is the case, "the benefits of amniocentesis far outweigh the risks" (ibid., p. 213).

3. **Fetoscopy** (a more invasive technique which also is used in combination with ultrasonography) involves the use of a solid optical endoscope (known as a "needlescope" or "dyonics fetoscope") to sample blood and tissues as a means of diagnosing some fetal hemoglobin diseases, hemophilia, immunodeficient diseases, chromosomal abnormalities in the face of equivocal amniotic fluid findings, and various serious fetal skin defects. Due to the invasive nature of this technique, efforts are being made today to diminish the need of fetoscopy in diagnosing diseases such as sickle cell disease by the DNA analysis of cells found in the amniotic fluid through amniocentesis (cf. item 5, below). The recommendation is that fetoscopy should never be done routinely by the practicing obstetrician, and that it be reserved to specialists in medical centers (ibid., pp. 233 and 238).

4. **Chorionic Villus Sampling** (CVS), another technique which should be reserved to specialists in medical centers, refers to the sampling and analysis of treadlike projections growing in tufts which appear on the external surface of the chorion (the cellular, outermost extraembryonic membrane) about two weeks after fertilization. This "shaggy" surface of the chorion eventually becomes the placenta (Dorland's *Illustrated Medical Dictionary*, 23rd ed., 1981, p. 264 "chorion" and p. 1456 "vilium"). This first trimester diagnostic technique, considered to be in the research stage in the U.S.A., is popular in countries such as China and the Soviet Union, which have rigid population-control programs (abortions in the early stages of pregnancy preferred, Cf. Queenan, p. 242). Again, rapid advances in the DNA analysis of cells obtained through amniocentesis are expected to diminish the need for the CVS procedure. When the technique is employed, ultrasonography provides an essential guide in the process.

5. **DNA (deoxyribonucleic acid) analysis** of cells found in the amniotic fluid through amniocentesis must be heralded as a technique of "great expectations." Limitations of space prevent a proper discussion of this technique, but the exciting possibilities of such a technique are revealed in the statement that "Certain highly variable regions of human DNA can be exploited to produce a pattern of DNA fragments that is as specific to an individual as is a set of fingerprints." That amazing statement is found in an article entitled "DNA Fingerprints in Health and Disease" in the Aug. 1, 1986 edition of *Science* magazine (pp. 521, 522). For human geneticists, the technique offers an "attractive method for seeking the location of defective genes in inherited diseases,

..." (ibid., p. 521). Although no inherited disease has been tracked down in the short time that DNA fingerprinting has been available, scientists are currently collaborating to realize such a significant objective (ibid., p. 522). Naturally both ultrasonography and amniocentesis would be prime contributing factors in such a promising project.

**The Answer: “Hopes Up” or “Thumbs Down?”**

The answer to the question posed in the title of this article definitely should be "hopes up." As to the danger of using the unfavorable results of prenatal testing to opt for abortion, Father Richard McCormick, S.J., in his 1984 publication entitled *Health and Medicine in the Catholic Tradition* (p. 140), mentions that about 650 amniocentesis procedures are performed annually at the Georgetown University Medical Center, and adds: "About ten of these will reveal problem pregnancies. Five of them will end in abortion (not performed at Georgetown)." Similar favorable statistics are found in Father Charles McFadden's (O.S.A.) book entitled *Challenge to Morality* (1977, pp. 72-74). It is important to point out that the suspender fear and anxiety created by not knowing about the condition of the fetus is more likely to lead to an abortion decision, than the consolation of knowing that the test results are favorable or at least not heartrending. With regard to fetoscopy, one expert mentioned that of 301 fetoscopies performed at one health facility, 222 of the patients continued their pregnancies. He added that, on the basis of providing proper information (test results), "we are saving 75% of the fetuses that would ordinarily be aborted..." (Queenan, p. 235).

The anticipated benefits in the use of these diagnostic techniques outweigh the calculated risks. Briefly, those benefits might be summarized as follows: (1) In facilitating the prompt treatment, even prenatally, of infants with birth defects. Blood and tissue samples can be obtained from the fetus at 18 to 20 weeks gestation; blood transfusions can be given to the fetus within the womb from 22 weeks onward, etc. (2) In advancing scientific research in the vast field of genetic diseases. One

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prime dividend of such a program is mentioned by Kutay Taysi, MD of the St. Louis Children’s Hospital, St. Louis, Mo.:

"Furthermore, patients with genetic diseases enter hospitals and stay longer, at least 5 times as frequently as patients with nongenetic diseases" (Genetic Medicine and Engineering, Albert S. Moraczewski, O.P., Ph.D., ed., St. Louis, The Catholic Health Association of the United States, 1983, p. 4).

(3) In promoting responsible parenthood in keeping with Catholic moral standards. Some couples who are willing and able to adopt an appropriate alternative, may have to be persuaded to have recourse to Natural Family Planning. The reasons for a “thumbs down” response to the question posed in the title of this article are neither persuasive nor compelling. Potential stumbling blocks can be turned into stepping stones. (See also Genetic Counseling, the Church, and the Law, Gary Atkinson, Ph.D. and Albert Moraczewski, O.P., Ph.D., editors, St. Louis, MO: The Pope John Center, 1980.)

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A Hopeful Alliance
The Relationship of Science and Religion

A bold step was taken recently by the Committee on Human Values of the National Conference of Catholic Bishops when it sponsored a meeting of scientists, theologians and bishops. In session from September 15, 1986 to September 18, 1986, the meeting was held in the congenial atmosphere of St. John’s Provincial Seminary in Plymouth (Detroit), Michigan.

It was the initial attempt to promote an active dialogue between science and the church. No attempt was made to solve any problems or propose any policy. Rather, it was a first official venture into a difficult terrain. This is not to deny that there had been earlier preliminary contacts in this country between bishops and scientists. Rather, this meeting represented the first of what will be an ongoing dialogue — modeled perhaps after the manner of various ecumenical dialogues now going on between the Catholic church and other ecclesial bodies.

Prominent scientists in the fields of physics, evolutionary science, psychology and biology were invited to present a paper. To each, a theologian-respondent familiar with the subject area delivered a prepared review. Each pair of presentations was followed by vigorous discussions, first in small groups of 7 or 8, then by all the participants. This process stimulated fuller and more candid participation. (The preceedings of the conference are to be available next spring.)

For the participants, there was an air of excitement, of adventure, of beginning a journey whose course and destiny are not at all clear. What is certain is that the community of faith and the community of science must be in a reciprocally beneficial discourse.

A Technological Society

Our human culture, particularly that of the Western world but increasingly of all nations, is technologically oriented. The values are those which support increasing control over the forces of nature. By means of communication technologies — telephone, radio, television — we have greatly shortened distances between people and communities. The joys and agonies of people which were once shared by just a few can now be vicariously experienced by people around the globe. An earthquake here, a volcanic eruption there, a plane crash on one continent and terrorist activity on another can be known and shared by millions of people.

Jet planes have also collapsed distances such that people can rapidly move from one continent to another. It becomes possible to have breakfast in Paris, lunch in New York (à la Concorde) and dinner in Rio de Janeiro. Millions of people can readily visit other lands and rub shoulders with their inhabitants, and visit a different culture each day of the week. These direct personal experiences with other languages, customs, laws and religions can have both a growth-producing effect or result in severe cultural-shock challenging values and beliefs heretofore held securely and comfortably.

In the realm of one’s world views, a person’s Weltanschauung, the theoretical exploration of research scientists in many fields — e.g., physics biology, psychology — propose perspectives and values derived there from which appear, at first hearing at least, incompatible with the traditionally held beliefs and teachings of the church. For many of the faithful, these proposals, these alternative explanations of human existence and destiny are profoundly disturbing. How does one reconcile what revelation and the church teaches with the assertions confidently proposed, and seemingly well established by the scientific community? This can lead to a crisis of faith or a vigorous response. Creationism has been a response of one faith group to the claims of evolutionary explanation of life and human existence.

Need for Ethics

At the same time, there is the realization that science and technology left to themselves can lead to disaster for the human race, if not for the entire biosphere. Increasingly among scientists and technologists, there is the awareness that applied science is a raw power which needs to be harnessed and directed. Because science claims to be value-free and because its method is, in a way, blind to human needs and concerns, it needs to be guided in such a manner that its insights and its powers truly promote the authentic well being of the human race.

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