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For Your Calendar:

The March 9-11, 1984 Workshop will have as its topic "Artificial Intelligence." If you have any suggestions for the faculty and specific topics within the general area, please contact Dr. John Cross, Department of Psychology, Saint Louis University, 221 N. Grand Blvd., St. Louis, Mo. 63103. More details will be listed in the January, 1984 Newsletter.

The October, 1984 Conference topic will be "Scientific Contributions to Theology" (a positive look at the contribution of science and technology to the life and thought of Christianity). The March, 1985 Workshop will be directed to "Space Exploration and Colonization." We would deeply appreciate your help with setting up these meetings. We need your input on what issues you think would make these discussions more informative and who can present them well.

For Your Attention:

We would call to your attention a book recently published by Roman Saliwanchik. Mr. Saliwanchik, a Patent Attorney from Richland, Michigan, is a valued member of ITEST and spoke at the ITEST Workshop on "The Patenting of Recombinant DNA", March, 1981. The title of the book is: Legal Protection for Microbial and Genetic Engineering Inventions, Addison-Wesley Publishing Company: Reading, Massachusetts, 1982, pp. xiii, 256. In the Preface, Mr. Saliwanchik writes:

Scientists are constantly in a position to advance the frontiers of the known. This course of achievement gives rise to a multitude of inventions. It behooves scientists to be aware of the rewards available to them for their inventions. Unfortunately, many, if not most, scientists do not receive any formal training in recognizing inventions or in how to obtain legal protection for them. This is incongruous in the light of the fact that scientists are trained, and indeed are expected, to make inventions during their work life. Filling this void in knowledge is a goal of this book. The information given herein has been assembled and related in a manner that is expected to be understood by the scientist. Additionally, enough legal substance has been woven throughout to be of value to practitioners and students in the business of providing legal protection for the inventions of scientists.

We would also call to your attention a book recently published by R. Wayne Kraft. Dr. Kraft, Professor of Metallurgy at Lehigh University, Bethlehem, Pa., is also a valued member of ITEST. The title of the book is: A Reason to Hope: A Synthesis of Teilhard de Chardin's Vision and Systems Thinking; Intersystems, Inc., Seaside, California, pp. xii, 274. In the Introduction it is stated:

The Jesuit paleontologist Pierre Teilhard de Chardin (1881-1955) has become famous because he expounded a new theory of evolution. It is a Christian interpretation of evolution. In much the way that Thomas Aquinas "baptized" Aristotle, Teilhard "baptized" Charles Darwin. In other words, Teilhard took the Darwinian theory of evolution, looked at it through the eyes of faith, and created a new and more comprehensive theory of evolution.

... This book sets forth one man's attempt to bridge the gap between science and religion, between things of this world and things of God. It is addressed to Everyman but I suspect it will be of prime interest to two types of individuals. One is the educated Christian who cannot quite see how his faith can be reconciled with fundamental scientific principles.... The other is the open-minded scientist who is searching for some unifying principle which will give him an unshakable faith in the value of his work.

#### WHAT CATHOLIC SCIENTISTS EXPECT OF THE CHURCH

by:

Dr. David J. Nagel  
Naval Research Laboratory

(The following is excerpted from a paper prepared for the ITEST Conference on "The Role of Christian Men and Women in Science in the Mission of the Church," Oct. 7-9, 1983. The entire paper will be published in the Proceedings of this Conference.)

The title of this paper is probably misleading since it implies that some survey of Catholic scientists has been made concerning what they expect of the Church. Not so! A more accurate title would be: what Catholic scientists might expect of the Church. But, actually the paper is about this: what one Catholic scientist has come to want from the Church once he stopped to think about it. Some personal and, hopefully, rational motivations for considering the subject are cited in the next paragraphs. Then several specific subject areas where science and technology overlap heavily with religious considerations are enumerated. The central thesis is a call for improved communications between Catholic scientists and their Church in existing and evolving areas of science and technology. A method to accomplish such communications on a routine basis is considered.

This topic of the overlap between technical and theological matters, and what to do about it, can be compelling for both individual and logical reasons. For me, the initial motivation was something of a sense of responsibility. God created a delightful universe which is a pleasure to study. Are we as scientists to be content with the individual satisfactions of our intellectual pursuits and their associated social aspects, such as attendance at technical conferences, correspondence with other scientists and the like? Or, do we have an obligation to use our special position in a way which will "return to God" some of what we are privileged to do and learn? If we are teachers, as well as researchers or technologists, there is a more demonstrable "payback" than is the case for routine publication of new results. However, even teachers may be able to participate more fully in the intellectual life of the Church in technical areas in which they do research or technical development.

Most Catholic scientists suffer from a separation of Church and Science. That is, each of us is but one person with what seems like two lives, one religious and the other technical.

Sundays there is little attention to technical matters. When was the last time you heard a substantive discussion of a topic heavily dependent on science or technology from the pulpit? How often do you read columns in the Catholic press on the advances in science which have clear import for religion? And, for most of us, at least in the non-medical sciences, the immiscibility of technical and religious matters is no better when viewed from the workaday world. Discussions of religion in any manner are rare "at work", let alone talk of the impact of current research on religion. Some topics tend to generate discussion more than others, but generally there is only random and infrequent discussion of religious matters in the laboratory because of the press of work and fear of offending colleagues. In short, there is too much of a tendency for the individual Catholic scientist to have one view when he looks toward the Church and another when he looks toward the Scientific Community. He cares deeply about both. What is the hope for more routine integration of the two arenas?

....The point is this: while at one time the Catholic Church was the repository of the world's knowledge, and while it has had ample time to assimilate, consider and provide guidance on the morality and ethics of action in areas influenced by technical matters, the response time of the Church is no longer short compared to the rate of change of science and technology. If the Church does not routinely and quickly assimilate not only actual advances, but also expected progress, it will be unable to act on external events in technical arenas in a proper, considered fashion, and it will be forced merely to react to events. In a world where technical information is increasingly respected and translated into financial and military power, it seems that being in anything but a position of leadership is unacceptable.

....Another way to appreciate afresh the growing importance of technical matters in the modern world is to consider some of the issues hotly discussed in recent decades. Nuclear weapons, nuclear power and environmental impact of industrial processes have been of major concern in the United States. These issues will not be put aside in the foreseeable future....

Looking ahead in other areas, genetic engineering has clear impact on the teachings of the Church. Consider the natural law in light of the current ability to transfer DNA between species and pass it on from generation to generation. The recent attention to genetic engineering of the human germ line is another barometer of the questions already at hand, questions which will press upon the Church hierarchy.

No less compelling are issues associated with the archtypical technological device, the computer. The question raised by current and easily foreseen silicon-based machines are already complicated. But very serious attention is now being given to molecular computers. These would be "machines" in which the active circuit elements are special organic molecules with appropriate electrical characteristics. Ultimate storage densities over one million times greater than that of the human brain are projected. That is, one cubic centimeter of the mass memory of a molecular computer could conceivably have over 1000 times the bit storage capacity estimated for the entire human brain....

Again the point is that the Catholic Church must be well aware of the status and directions of research and implementation in the area of artificial intelligence....

The steps which might be taken to improve Catholic knowledge and use of leading-edge science and technology seem clear and almost obvious. There must be improved communication on technical matters from Catholic scientists to the hierarchy and on theological, moral and related matters from the Church to its scientists and members at large. The first step could be to simply identify those who are to communicate. Who are the Catholic scientists with particular areas of expertise and the desire to participate more fully in the intellectual life of the Church? Those of us who do research full time often do not know who among our colleagues is Catholic, once we go past the limits of our immediate groups. Jewish scientists do vastly better in knowing each other and taking advantage of their common viewpoints. Is there some way in which to survey Catholics and/or scientists in order to identify the men and women who have the qualifications and desire to contribute in a responsive manner to the Church? On the Church side, who are the cardinals and bishops who are specially interested in the impact of science and technology on the present and future Church?

....There are organizations of Catholic doctors and lawyers. These groups may not be truly representative of the capabilities and thinking of most doctors and lawyers who are Catholics. But, they do provide a pool of people who can respond to Church needs or provide access to those who have the know-how to produce what is needed. Might not there be a Catholic Scientists Guild? The Pontifical Academy of Sciences functions on a global level. A Guild could operate on a national level. It might perform several functions beyond satisfying the needs of the Hierarchy for timely and in-depth information.

No  
A major and growing problem in the United States today, some feel, is the growing gap between the importance of technology and the knowledge of technical matters by the population at large. The rapidly growing numbers of microcomputers disguises the fact that most people do not really have much knowledge of the high-technology devices in their midst which affect heavily the way in which they live. How many people know how a supermarket bar-code scanner works? The current emplacement of optical fibers around the country will have an ultimate impact comparable to rural electrification. Is the technology broadly appreciated? It is granted that not everyone has to know how everything works. However, it does not seem healthy for the nation to have a large fraction of the population resigned to not knowing how more and more things work. Will loss of the can-do, fix-anything attitude matter? Consider the paranoia already surrounding impersonal computerized bills. ...What is the point of these considerations? Indeed, a Catholic Scientists Guild could perform an education function for the Church at large, as well as for the Hierarchy, which could contribute significantly to easing the national problem. What would be wrong with well-written explanations of scientific and technological advances



appearing in the Catholic press? Certainly there is now available a delightful range of popular science magazines, many of them instituted in the past few years. Discover, Science 83, Omni, Science News, Scientific American and a host of computer-oriented publications are now widely read. But, would not some clearly-written articles on the delights and challenges of science and technology enliven the Catholic press and help educate the population at the same time?....

Expectations may also include the hope that the Church would revel in the joys of science and technology. The deep feelings associated with Catholicism are most satisfying. So are the deep feelings engendered by the processes and results of research. It has been said that failure is the dominant experience in science. Indeed, many experiments do not work. But, the struggles slip from mind and the sweet successes remain. The intense pleasure of discovery, and of the admiration of God's handiwork, are very akin to the joys of religion.

In summary, it seems that both scientists and the Church would benefit from better use of the special knowledge of Catholic scientists by the Church.

(A quotation from "The Origin of the Universe" by Victor F. Weisskopf, Institute Professor Emeritus of Physics and former head of the Department of Physics at the Massachusetts Institute of Technology. The article appeared in American Scientist, September-October, 1983, p. 480).

"This article began with a remark about how strongly our topic is connected with other human interests, with philosophical, mythological, and religious concerns. It hits us in the heart, as it were. The origin of the universe can be talked about not only in scientific terms, but also in poetic and spiritual language, an approach that is complementary to the scientific one. Indeed, the Judeo-Christian tradition describes the beginning of the world in a way that is surprisingly similar to the scientific model. Previously, it seemed scientifically unsound to have light created before the sun. The present scientific view does indeed assume the early universe to be filled with various kinds of radiation long before the sun was created. The Bible says about the beginning: 'And God said, let there be light and there was light. And God saw the light, that it was good.'"

## CHRISTIANS IN SCIENCE

BY:

Robert Brungs, S.J.  
Director: ITEST

(Excerpts from a paper presented at the ITEST Conference on "The Role of Christian Men and Women in Science in the Mission of the Church." The entire paper will be published in the ITEST Conference Proceedings.)

The (Vatican) Council finds the call of the laity in baptism:

The laity derive the right and duty (*italics mine*) with

respect to the apostolate from their union with Christ their Head. Incorporated into Christ's Mystical Body through baptism and strengthened by the power of the Holy Spirit through confirmation, they are assigned to the apostolate by the Lord himself. . . . For their part, the sacraments, especially the most holy Eucharist, communicate and nourish that charity which is the soul of the entire apostolate. (Decree on the Apostolate of the Laity, no. 3).

The primary emphasis -- or the necessary base -- of the apostolate of the laity is the growth in union of the Christian with Christ. . . . Each Christian is called to personal union with Christ, a union that always carries a communal dimension. Moreover, it always carries with it a necessary evangelical component. The parting words of Christ to his disciples applies to each Christian as a right and a duty: "Go, therefore, make disciples of all nations: . . . and teach them to observe all the commands I gave you. . . ." (Mt. 28:19). This mandate is not limited to the leaders of the Church; rather it is addressed to each one of us who has been called to union with Christ. . . .

This mandate, this right and duty to the apostolate, is based on our sacramental incorporation into the Trinity through baptism, confirmation, and the Eucharist. Such participation in God's activity in the world is not optional for us Christians. We must share this life we have been given. We must spread the Word (who is Christ) in and through our lives.

In terms of the goals to be achieved by the apostolic lives of Christians, Vatican II states:

. . . the mission of the Church is not only to bring men the message and grace of Christ, but also to penetrate and perfect the temporal sphere with the spirit of the gospel. (no. 5)

To achieve this goal the Council commends the "witness of one's way of life." This is basically giving, by the example of our lives, witness to the power and love of Christ. If I may so say it, it is showing in our lives that the Good News is more than a rumor. The Council then goes on to state that, over and above that witness of our example, "a true apostolate looks for opportunities to announce Christ by words addressed either to non-believers with a view to leading them to faith, or to believers with a view to instructing and strengthening them". (no. 6)

The Council then turned to some aspects of the context in which the laity is to exercise its mission:

. . . modern conditions demand that their (the laity) apostolate be thoroughly broadened and intensified. The constant expansion of population, scientific and technical progress and the tightening bonds between men have not only immensely widened the field of the lay apostolate, a field which is for the most part accessible only to them. These developments have themselves raised new problems which cry out for the skillful concern and attention of the laity. . . .

The laity must take on the renewal of the temporal order as their own special obligation....As citizens they must cooperate with other citizens, using their own particular skills and acting on their own responsibility (italics mine). (no. 7)

The Council called for the laity to expend itself in leavening the culture, to participate in what the Council called the "apostolate of the social milieu." It is here specifically where we can locate the role of Christian men and women of science in the mission of the Church:

In the present circumstances, it is quite necessary that, in the area of lay activity, the united and organized form (italics mine) of the apostolate be strengthened. In fact, only the close pooling of resources is capable of fully achieving all the aims of the modern apostolate and firmly protecting its interests. (no. 16).

In the fall of 1977, at the Fifth Synod of Bishops in Rome, the U.S. delegates issued a statement entitled "The Church and Scientists" (Origins, Nov. 10, 1977, Vol. 7, No. 21, pp. 330-331).... (They) remarked that in the apostolate of the social milieu "the world of science and technology cannot be ignored." They then mention the need for "united and organized" effort:

...evangelization and catechesis by scientists who are men and women of faith are extremely important. They should be encouraged by the church. They constitute one of those small groups which will be responsible for so much of the mission of the church in the years to come. Scientists who acknowledge the reign of God should be encouraged to form communities (italics mine) where they may grow in their own understanding, experience and response to their...faith, and where they show their insights into how the mysteries of redemption can be presented to their brothers and sisters who are seeking answers to the dilemmas posed by their scientific research....

The Council and the Bishops essentially tell us that the very fact of being Christians must lead us, like the disciples on Pentecost, into the "streets of the world." There, by the testimony of our lives (i.e., our own holiness, our active union with Christ) and by the testimony of the word we are to strengthen the church and to leaven the culture....