INSTITUTE FOR THEOLOGICAL ENCOUNTER
WITH SCIENCE AND TECHNOLOGY
(ITEST)
NEWSLETTER

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For Your Calendar:

The March 19-21, 1982 Workshop-Conference will deal with the impact of contemporary science and technology on the survival of the nation state. We shall consider the following aspects of this topic: economics, geopolitics, technology, development, theology, and biology/environment. The economic issues will be discussed by Dr. Ervin Laszlo (UNITAR-United Nations); geopolitics by Dr. Ernst von Weizsäcker (U.N. Committee on Science and Technology for Development); the technologies themselves by Dr. Steven Puro (Saint Louis University); biology/environment by Dr. Thomas Berry (Riverdale Center for Religious Research); development by Dr. John Cooper (Bridgewater College, Virginia); and theology by Dr. Duane A. Priebe (Wartburg Theological Seminary). If you are interested in attending this Workshop/Conference please write to Fr. Robert Brungs, S.J.; ITEST; 221 N. Grand Blvd.; St. Louis, Mo. 63103; USA.

The October 1-3, 1982 Conference is still in the planning stage. It will be held in Glenview, Ill., a short distance from O'Hare Airport, Chicago. The topic is "The Meaning of Health." This will be considered from the aspects of the nurse, doctor, administrator, psychologist, and theologian. It will look at present and relatively near future issues.

ITEST NOTES:

We are issuing still another invitation for essays for the Newsletter. These essays should be of the order of 1500-2500 words on topics of interest to those concerned with science, technology, faith, society, etc. Essays up to twice that length on vital topics will be considered. Believe me, the Newsletter editor would be extremely pleased not to have to find fillers to bring the issue up to size. This is your forum. Please let us know what your thinking.

As we reported in the last issue of the Newsletter, the most important item before the Board of Directors is the planning for the 15th anniversary year of ITEST's corporate existence. There we said "We should like to present an integrated year-long program to celebrate this event. We would like you to let us know what you would like to see us do....We do need your ideas on the most profitable (and enjoyable) way we can celebrate this corporate milestone. Be as utopian as you wish. It will be the Board's task to get things to fit within the budgetary restrictions." To date we have received only one recommendation for that program. Can't we do better than this? There is still enough flexibility in the planning to incorporate other ideas. So, please let us know what you would like to see us do.

"Some Random and Outrageous Views on
Science, Values and Education at Purdue"

(The following was presented to the Science/Theology Group of Faculty and Graduate Students at Purdue by Dr. Joseph Haberer of the Department of Political Science at Purdue. It is reproduced with Dr. Haberer's permission. Perhaps the academics among us might use it as an "examination of our academic consciences.")

1. At Purdue the name of the game is training, rather than education. For the most part we turn out proficient or competent engineers, scientists, managers, and others who will fit in. We pay lip service to education, to the humanistic, liberalizing and civilizing role that once was part of a college education.

2. What is the educational philosophy at Purdue? Is there any clear expression -- any unifying curricular design that reflects a coherent, value oriented theory of education? Isn't what comes under the rubric of core courses, etc....really, a hodge podge, cafeteria style "education"?

3. Do we inculcate values in our students? Of course! But more often than not, value education comes to the student in a package of unexamined assumptions, opinions, attitudes that permeate the environment in which students learn. Do we really encourage students to think, reflect, question, strike out on their own? Or isn't the message: be competent, fit in, don't make waves, play it safe, be successful, and if you can't quantify it, (at some point) is it really worth bothering with in our scientific and engineering education?

4. The Two Culture Syndrome is alive and well at Purdue: Humanities students usually approach courses with any science/technology component, in whatever school it is given, as some sort of rare disease to be shunned; science and engineering students avoid humanities courses because they are thought to be either too mushy, too hard, useless to their career objectives and probably a hundred other reasons. Where the students are, can the faculty be far behind? For the most part, mutual indifference at best, veiled hostility at worst; two universes rarely in touch with each other -- and both the poorer for it.

5. And what about the training itself: in the schools of science and engineering and the other professional schools? How well are we training the future engineers and scientists to function in a world where value questions, where matters involving social priorities, policy issues that will impinge on them as practicing professionals? For all practical purposes: the schools are devoid of any sustained, meaningful effort to prepare their "products" for the real world, where the big value/policy questions will be on the front burner. Ah, yes, there may be a course or two that deal with the value questions in some schools....but, given that it is always an elective, do you know how many students take it?

6. That which you sow, you shall reap -- as the good book has it -- is surely true of a society's educational and socializing efforts. What are we sowing, and what shall we reap given the system that is now operating?

7. Ah, yes, we do have some fall-back positions, don't we? First, our students are picking up the value components somewhere else (it is none of our business) and then, perhaps, they get it by osmosis. Second, for heaven's sake isn't it enough that we work ourselves to the bone to turn out competent professionals: there just isn't enough room in the curriculum to do much more!!!

8. From a value, ethical point of view are we in danger of creating an educational monster -- a system that turns out "fachidioten" -- specialists without heart, children of Eichman, those whose value system reflects "the banality of evil"?

9. If any of the above rings a bell -- where for heaven's sake do we the faculty fit in? What is our responsibility? What kinds of commitments ought to be undertaken? How would one want to restructure the education, the curriculum so as to include a more unifying, humanistic, and civilizing view of the world?

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Five Years Ago in the ITEST Newsletter:

(To lend a bit of perspective to our present work, the editor from time to time will include an excerpt from the Newsletter of five years ago. The following is from the January, 1977 issue. It can be seen that some basic issues remain with us even though their context has changed significantly.)

"There is an issue of grave significance boiling under the surface of the scientific community as well as of society in general. In its broadest statement the issue involves the question of gaining further knowledge, especially scientific and technical, and whether there is some limit to what we should try to discover. This issue will become increasingly visible in the next decade or so. The problem of the spiraling increase in knowledge is highly complex and its solution is going to be very difficult. It is complex simply because it cuts across most aspects of human life. It will be difficult to handle because of radically opposing views among people and peoples, because of different levels of expectations and fears raised by scientific advance, because of vastly disparate estimates of risk and gain....

"Let us consider the attempts to increase our knowledge in areas such as recombinant DNA research. (Ed. that knowledge has exploded in the 5 years since this was written, as evidenced in ITEST's Proceedings on "The Patenting of Recombinant DNA," March, 1981). Undoubtedly our knowledge of basic genetics will be enormously increased by such research. Likewise, there is no doubt that this knowledge will be of value in bettering the human condition, though not so automatically as some propagandists for science seem to think....The tendency on the part of some scientists to leap to "this is the experiment that will answer all questions" is both amazing and amusing. Viking II was billed as the answer to the question of whether or not there is life on Mars. To date all we have are more questions....

"Another more subtle danger (than that of creating a uncontrollable recombinant "Frankenstein bacterium") is the seemingly continuous and continual growth of knowledge with little concomitant growth in human wisdom to handle the knowledge. Can we know too much? Alexander Pope once

wrote that a little bit of knowledge is a dangerous thing. Is a lot of knowledge a dangerous thing? Can we agree with one of the Cambridge (Massachusetts) Council members, David Clem, who is reported in Science to have said: "I have a gut feeling that ten to fifteen years from now I am going to regret having worked toward a compromise on this issue, because I think we are stretching out limits of being able to respond in a civilized way to the fruits of knowledge. We are becoming fat with all this knowledge, so fat and bloated we may not survive"....We are piling up more knowledge than we have shown we can handle responsibly. Moreover, this is not just any knowledge, but knowledge that has enormous potential for both good and evil....

"...we can take for granted that we have over the last quarter of a century or so discovered far more things than we have been able to integrate either conceptually or socially. This is true not only of the non-technically trained citizen. It is perhaps most acutely seen in the professionals themselves. This inability to integrate our new knowledge into some kind of a coherent understanding has in part led to the proliferation of scientific and academic specialties and sub-disciplines. It is perhaps seen most sharply in our experiences with the medical profession. If we get sick these days, how many doctors do we end up seeing?....When knowledge becomes so fragmented and specialized that people; highly trained in the same general discipline -- take physics as an example -- cannot really communicate with each other across the boundaries of their specializations, a real social problem arises, especially in issues of serious social consequences....Without some kind of social coherence a society will inevitably collapse. We can come to a point where too many different things are being said by too many different people or groups. At that point decision-making becomes virtually impossible.

"One thing to be avoided in our present situation of rapidly increasing knowledge is the easy assumption that these issues of society and knowledge are to be solved legislatively or judicially. We tend too quickly to dismay and despair of solution in our society. Then we rush to government, whether local or federal, for solutions. Recently we have seen federal guidelines on everything from research on human subjects, to guidelines on safety in recombinant DNA research, to attendance at father-son banquets. This facile recourse to government does not recommend itself to me. In the end it may become necessary, but other avenues ought to be explored first. Regulatory agencies have a real place in society, but not over every aspect of human life and social well-being. And not as a first resort!

"Another thing to be avoided is the easy assumption of either of two extreme reactions to the problem of the proliferation of information. The first of these is that the fastest and most effective way to handle the situation is to ban certain types of research. This would certainly solve the immediate problem, but at a cost that might well be prohibitive in terms of its long-range social consequences. The other extreme position is that all knowledge is beneficial and that there should be no limits whatsoever on its acquisition. Not all knowledge is beneficial and not all modes of finding of it are good. It is necessarily only to recall the brutal experimentation of the Nazi concentration camps (as well as the Tuskegee syphillis studies) to verify that. Moreover, it is not necessary that we seek now to find answers to all possible questions. The solution to our particular questions lies somewhere between these two extremes. We shall lose many good things by prematurely foreclosing experimentation. Nor shall we get to the heart of the information problem by a total hands-off policy.

"....We need at least an informal, though flexible, consensus on priorities in research. No society, not even one as wealthy as ours, can do everything. At the same time we cannot ignore the rights of our researchers to work in areas that intrigue them. But society has no obligation to see that everything that they wish to work on is funded from public sources. There must be give and take here and all members of our society should have at least the opportunity to express their views and to be taken seriously. We also need a climate of respect between the research community and the citizenry. Until an atmosphere of respect and trust is constructed nothing of lasting value to the society will eventuate. Presently in too many discussions on such issues as science versus society the emphasis is on neither "science" nor "society", but on "versus"....

"With some kind of informal and flexible consensus on priorities, arrived at in an atmosphere of trust and respect between the research community and the society at large, the base for some progress -- although neither a quick nor sure solution -- could be made. The general public has too readily forfeited its right to have some say in the allocation of public money for various types of research. The scientific community, on the other hand, has been too content to sit in its specialized isolation and not to attempt to explain what it is doing and why it is of value. If the truth were told, probably both groups are terribly frightened of each other. This fear is manifested by ridicule on the one side and recourse to esoteric jargon on the other. Instead of mutual esteem and understanding we get fear and competition. The (growing) rift between the research community and the average citizen is needless, stupid, and unproductive. It is time for both groups to wake up to the fact that they are not in competition but rather are natural allies. Allies in what? The real threat to both lies in an ultimate governmental stranglehold on the funds for research, on the direction that research will take and on the use of the fruits of that research. The bureaucrat has no option on truth or social need that renders him or her better able to cope with these questions than the research community in alliance with the public. But the process of governmental control of science and technology is well begun and can be ignored only at our peril.

"There must be an energetic contact between the research community and the active, responsible, and responsive elements in the general public. The fostering of such contact to discuss matters such as research and its limits would be a good project for a large foundation or consortiums of foundations. It could generate the basis for future discussion and agreement on such basic issues....

"In recombinant DNA research, nuclear power, environmental concerns, or any other scientific-public issue we can not assume that government bureaucracy will offer a better vehicle for weighing risks and benefits than will the general public. These are not matters best left to the scientific community alone, the general public alone, or the government alone. We should not have recourse to government, either local or federal, except as a last resort. It is to be hoped that the research community and the average citizen can get over their fear of each other and profitably discuss this larger issue of knowledge and public risk. If this is not done by the two communities it will be done for them."

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The Continuing Creationism Controversy

by: Kevin T. FitzGerald, S.J.

Last Spring, the California superior court was the site for a trial advertised as "Scopes II."[1] In the Fall, attention shifted to a trial in Arkansas concerning legislation which required creation science to be taught in the classroom along with evolution. Once again, the creationists and evolutionists squared off. Though the courts finally ruled in favor of California's guidelines for teaching evolution in the classroom and against Arkansas' law, the creationists appear determined to regain at least some of the ground they lost in the 1925 trial.[2]

The latest tactic of the creationists is to demonstrate that their theory of creation and the evolutionary theory are on the same level. This tactic depends on pointing out the scientific nature of creationism and the religious nature of evolution theory.[3] At the crux of this issue is the philosophical inquiry into what is good scientific theory and what is not. As creationist attorney Richard K. Turner states, "If you can prove that the theory is simply a poor theory, and that scientists still believe in it and fight over it, then you've started to prove that it's akin to believing that there's a God."[4] The validity of this stance of the creationists is the concern of this paper.

One of the foundations of scientific method is empirical evidence. It is from empirical evidence that scientists have built their theories on the age of the universe (about 20 billion years), the age of the earth (4.5 billion years), and the beginnings and evolution of living beings. On the other hand, there are creationists who claim that everything was created about 6,000 years ago. This claim is based on Bishop Ussher's chronology of father-son relationships in the Bible.[5] Revelation is not considered empirical evidence. The creationists, themselves, will admit that the Bible is not a scientific text.[6] Therefore, the creationism theory is not scientific in this instance. The question of the validity of Bishop Ussher's chronology is one of Scriptual exegesis, not of discovering intelligibilities in empirical evidence.

When the theory of creationism is presented in general, the support of the theory usually consists in exhibiting the flaws in evolutionary theory. No scientific evidence is presented to support creationism. In fact, no scientific evidence supports creationism, rather it is based on the authority of certain Biblical interpretations.[7] Although creationism is often proposed by scientists who use scientific terminology to support their position, nonetheless the involvement of scientists and scientific language does not necessitate the scientific validity of creationism. Hence, the claim that creationism is scientific is false.

Some creationists disregard scientific evidence, saying it is irrelevant because the Bible contains absolute truth while scientific theories and laws can never be absolutely proven.[8] The validity of this statement is not verifiable, and it does not claim to be scientific. If it did, then any Biblical interpretation could claim to be scientific. Hence, the statement itself is irrelevant regarding equating creationism with evolutionary theory, and is not useful in the pursuit of getting creationism taught in science classes. Still, the question remains, "Is evolutionary theory good scientific theory or not?"

Creationists claim that evolutionary theory is not proper scientific theory. If this claim is true, then it would not prove creationism to be true, but it would tend to put both views on the same level -- which is what the creationists want. An aspect of scientific theory is its ability to predict future events. Evolutionary theory, they claim, cannot make significant predictions. In

fact, they claim it can only make significant explanations about events long past.[9] This claim implies a philosophy of science that requires a theory to work well in both temporal directions, past and future. Philosopher Barry Gross believes that this is not necessarily the case:

> There is no reason to hold that all theories properly described as scientific are predictive. A theory might well be oriented in one temporal direction for explanatory purposes, in this case the past, and still provide a scientific explanation in its domain. And if falsifiability were held to be the criterion for distinguishing scientific from non-scientific theories, it would not be too hard to devise tests for such a theory.[10]

However, creationist Robert Kofahl contends that retrodictions cannot be validly used as the basis for testing or for conclusive falsification of evolutionary theory. "Failure to find some type of retrodiction data can always be explained away, and often has been."[11]

This rejection of the theory of evolution based on its inability to be properly tested and possibly falsified is rooted in the philosophy of Sir Karl Popper. He emphasizes falsification as a criterion for scientific theory rather than confirmation of the theory's validity. In the past, he described evolutionary theory as almost tautological, and therefore a successful metaphysical research program instead of a scientific theory. Popper, unlike the logical positivists, argues that metaphysics is quite meaningful, albeit unfalsifiable. Hence, there are metaphysical research programs. But is evolutionary theory one of them? Recently, Popper published this change in his position:

> The theory of natural selection may be so formulated that it is far from tautological. In this case it is not only testable, but it turns out to be not strictly universally true. There seem to be exceptions, as with so many biological theories; and considering the random character of the variations on which natural selection operates, the occurrence of exceptions is not surprising.[12]

This alteration not only undermines the creationist position from the perspective of their heavy use of his philosophy to assault evolutionary theory, but also from the perspective that it allows for certain exceptions to the theory which the creationists might wish to use to demonstrate its invalidity.

In addition to the criticism of evolution's methodological problems, the creationists also point to the many doctrinal disputes within evolutionary theory.[13] Questions arise concerning the speed and continuity of speciation, the analysis of radioactive decay in dating fossils, alternative interpretations of a specific piece of evidence, etc. Because of these disagreements, some creationists claim that scientists are holding on to the theory of evolution out of blind faith. It is true that there are differences of opinion and interpretation concering the details of evolution. However, the fact that there are disputes points more toward the intellectual honesty of scientists seeking the truth than toward scientists blindly bolstering a false dogma.[14] The distinction is that scientists

are not manipulating the data with "ad hoc" interpretations, but are attempting to "fine tune" evolutionary theory. According to Duhem's theory concerning the confirmation of theories, the scientist can alter or replace any part of a theory that does not correspond to the data and still not have to scrap the entire theory. This challenging and refining of ideas is integral to the scientific method.

Finally, in direct response to the creationist proposal that evolutionary theory is somewhat "religious," Barry Gross asserts that for a doctrine to be religious it must necessarily purport the existence of at least one supernatural deity.[15] Evolution, of course, proposes no such thing, and this lack again demonstrates the difference between creationism and evolution.

Creationists are in the process of attempting to equate their position with evolutionary theory. It has been demonstrated that creationism does not qualify as a scientific theory, while evolutionary theory does qualify. In addition, evolutionary theory is not "religious" as the creationists might contend. The recent court decisions parallel this conclusion and reject this attempt to use the public school system to teach religious beliefs as science. Unfortunately, this struggle for an invalid stature for the creationist position in the classroom has led to a greater tension between science and religion. This increasing tension is unnecessary and detrimental. Much more could be accomplished by pursuing a positive blending of religious experience and belief with scientific knowledge, rather than creating false dichotomies.

## Footnotes

1. William J. Broad, "Creationists Limit Scope of Evolution," Science, vol. 211, 20 March 1981, p. 1331.

2. Ibid.

3. Ibid.

4. Ibid., p. 1332.

5. John W. Klotz, Genes, Genesis and Evolution (St. Louis: Concordia Publishing House, 1972), p. 88-89.

6. Ibid., p. 8 & 11.

7. Isaac Asimov, "The 'Threat' of Creationism," N.Y. TIMES Mag., 14 June 1981, p. 96.

8. Ibid.

9. Broad, p. 1332.

10. Barry R. Gross, Science, vol. 212, 15 May 1981, p. 738.

11. Robert E. Kofahl, Science, vol. 212, 22 May 1981, p. 873.

12. Hans Zeisel, Science, vol. 212, 22 May 1981, p. 873.

13. Broad, p. 1332.

14. Asimov, p. 94.

15. Gross, p. 738.

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## Toward a More Effective ITEST

Over the years the Board of Directors has suggested that the work of ITEST would be more effective if we had a larger membership. At present it is projected that the 1982 membership will top 500 (in 25 countries). Our source for new members has always been the enthusiasm of those who were already members. If we are to be successful in building an enduring international, inter-faith, interdisciplinary community, our members (you) are still the basic source of our growth. Consequently, we would ask each of you, if possible, to tell two more of your friends and colleagues who we are and what we do. Such communication is necessary if we are to continue this work.

Let us recall to you the purposes of ITEST:

(1) to act as an "early-warning system" for the churches about work being pursued in the laboratories;

(2) to translate this information into the various ecclesial vocabularies;

(3) to identify and respond to those scientific and technological developments that bear on Christian belief;

(4) to help build a community of scientists dedicated both to the advancement of our scientific understanding as well as to the growth of the Church.

Please tell people, who are likely to be interested, about ITEST.