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NEWSLETTER

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Announcements:

A. The ITEST spring workshop will be held at Fordyce House, St. Louis, March 16-18, 1979. The workshop will focus on the social, economic, political effects of governmental involvement in and regulation of technology. The workshop leaders will be:

- (1) Mary-Margaret Richardson, Consumer Affairs Officer, U.S. Food and Drug Administration, St. Louis
- (2) Professors Hugh Martz and Richard Stith, III, School of Law, Valparaiso University
- (3) Dr. David Truemper, Department of Theology, Valparaiso University
- (4) Mr. Richard Umdenstock, American Hospital Association, Chicago
- (5) Dr. Patrick Welch, School of Business, Saint Louis University.

Further details of this meeting can be obtained from Fr. Robert Brungs, S.J., Director: ITEST, 221 N. Grand Blvd., St. Louis, Mo. 63103.

B. Note also that the dates for the ITEST Conference on Technology of Social Control are October 5-7, 1979. The Proceedings of the March, 1978 workshop will serve as the base for this October Conference. Further details will be announced later.

C. The Society for Philosophy and Technology, in conjunction with the American Catholic Philosophical Association meeting in Toronto, April 20-22, 1979, will sponsor a symposium on "Philosophy, Technology, and Theology." There will be two sessions. An afternoon session, from 2:00 to 4:00 PM, will feature two papers: E. Schuurman (Vrije University, Amsterdam), "Technology: Curse or Blessing"; Frederick Sontag (Claremont College), "Technology and Theodicy." The evening session, from 7:00 - 9:00 PM, includes papers by: Ernest Fortin (Boston College), "Augustine, the Arts, and Human Progress"; and Paul Durbin (University of Delaware), "Thomism and Technology." Further details can be obtained from Prof. Carl Mitcham, St. Catharine College, St. Catharine, Kentucky 40061.

D. The International Secretariat for Scientific Affairs (SIQS) of Pax Romana:

For several reasons, the Bulletin of SIQS cannot continue as formerly. During the last several years it appeared irregularly. It has, therefore, been replaced by a journal, Convergence, which will be published when articles with a special interest for scientists are available. Since sciences and techniques

are major components of contemporary culture, subjects related to them are of general interest. It is expected that Convergence will contain studies of a scientific character. Convergence is published in a French and in an English version. Convergence, No. 3, 1977-1978 includes the following articles: "To be an intellectual in Europe, today Why? How?"; "Christians and European Socialist Systems"; "Christians and Socialism in Poland," "European left and social change," "Science and anti-science." It concludes with a review of an important book of Jean Ladriere, Rationality at Stake. Further information can be obtained from Professor Lucien Morren, Celestijnenlaan, 101, B-3030 Heverlee, Belgium.

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### The Medical Genesis: Co-Creators with God

by: George Schurr  
~~Center for the Study of Values~~  
~~University of Delaware~~

Test tube babies! Behavior modification! Genetic engineering! Cloning! On and on it goes. Has the natural order crumbled? Has the physician-scientist replaced God? How far are we to go in granting to physician-scientist the power to control and transform natural processes? The questions are becoming endemic. Too frequently they are phrased in terms of whether or not we are for or against life, pro or anti human, supporting or opposing God. But the basic issue is avoided: the issue of responsibility. New knowledge and new techniques make possible new decisions. Will the decisions be made responsibly?

In 1967 I was asked to write a brief introduction to the ethical issues arising out of bio-technology, to be used in conjunction with a CBS-TV "Look Up and Live" series. I was bothered by the title the editor of the Journal, Paul Sherry, gave to my contribution. He called it, "Bio-Technology: The Temptation to Play God." Too sensational, I thought. It promised grander virtues and vices than my article professed. It seemed simply silly to claim that anyone would really be tempted to play God. I was wrong. There are physicians and medical researchers who are not just tempted -- they play God. And that seems bad on the face of it.

Are we not supposed, finally, to leave matters of life and death up to God? But hold. Some physicians use that as an excuse to avoid responsibility. The physician does not have all power, but he does have a powerful responsibility. He does not leave birth and death to the arbitrary decision of some far off deity. Medicine has developed precisely because generations of physician-scientists have accepted the responsibility to create new possibilities for life. The true physician does not "play" God; he accepts the responsibility to bring life in the midst of disease and death. In theological terms, the modern physician is, indeed, a co-creator with God.

The physician is a co-creator with God! That does sound like a bit of far-fetched arrogance, doesn't it. Does it mean that the physician has arbitrary power to bring life and death, not to mention defining the conditions of living? Does it mean that the physician can rightfully accept the plaintive desire of the patient who wants him to satisfy every request for a longer and more pleasant life? No. Those are the temptations to play God, not to be co-creators with God. And thereby comes the confusion. The awe-full responsibility to be a co-creator can become an arrogant temptation to be an irresponsible self-creator.

A dozen years ago Jose Delgado, while participating in a National Council of Churches sponsored Consultation on Technology and Human Values, announced that we now have the ability to fulfill the Biblical injunction to dominate nature, including our own nature. I was disturbed. He seemed to be claiming religious justification for arbitrary power. The control of all of creation, including our own psycho-physical constitution, was subject to our preferences. I objected. He insisted, and thereby justified his own work in "mind control" through electrical intervention in the brain. He claimed to be able to direct experimental animal subjects to do whatever he wanted them to do. He was beginning to realize the same behavior control with human subjects. I pressed him about limits to what he could do. Finally he conceded that, while he could elicit potentials which were already present in his experimental subjects, he could not make them do that which was not available in their behavioral repertoire. Still, it seemed to me that something was wrong.

About the same time voices began to be raised blaming our ecological problems on the Judeo-Christian tradition (e.g., Lynn White, Jr., "The Historical Roots of our Ecological Crisis," Science Vol. 155, 1967, pp. 1203-1207). Genesis 1:28 was the claimed root of this evil. Man was, apparently, granted carte blanche to "fill the earth and subdue it." Now, having raped nature by divine commandment, we were reaping the evil fruits of violating natural order. Christianity, it was claimed, was a mistake. We should become passive and receptive to nature. We were not to dominate, but yield. Physicians were not supposed to explore frontiers, but return to nature's ways. Again, something was wrong.

The order of nature is not so static and placid. The course of evolution is not a simple working out of natural order. Nature is not fixed. It is full of tensions, stresses, interactions and conflicts. Arbitrary domination of nature might be wrong, but irresponsible subjection to nature is equally wrong. Simply returning to nature is not just a counsel of despair; it is false to nature and clearly contrary to the way Jesus went about his work!

A careful reading of the Biblical sources led me to discover that both are wrong because both are half-truths. Genesis 1:27 reads: "God created man in his own image." Then Genesis 1:28 follows,

And God blessed them, and God said to them,  
'Be fruitful and multiply, and fill the earth and  
subdue it; and have dominion over the fish of the  
sea and over the birds of the air and over every  
living thing that moves upon the earth.'

A little further on, the account of the sixth day of creation is concluded, in Genesis 1:31, with this observation, "And God saw everything that he had made, and behold, it was very good." In the image of God, man has dominion to make everything good. There is no carte blanche for irresponsible dominion over nature here. Rather, there is a responsibility to care for all of creation, as the one creature made in the image of the God who saw the good of his creation. The good of the created natural order is inseparable from man's responsibility for dominion over it according to the covenant that God established, in God's image.

STOP HERE

Who is the God in whose image we are made? Clearly, the Biblical God is the creator. Clearly, the Biblical God enters into faithful covenant. Men, the Bible says, are made in the image of this



creative covenant maker. Men may use their creative power to violate their covenant responsibility. God does not. Over and over again, we are called to be faithful, as he is faithful; to be just, as he is just; to be holy, as he is holy. The God of integrity insists that the integrity of mutual responsibility must be realized, as it was in his creative intent.

Man, though made in the image of the creator, does not keep the covenant responsibility. That is the problem. In sin, man corrupts the creative image and assumes irresponsible authority or is seduced by legalistic conformity.

Then, through Christ, the new creation enters. The true creative word dwelt among us, full of grace and truth, "And from his fullness have we all received, grace upon grace." (John 1:16) In Christ the image of God is established again as the norm of human kind. Those who are called to life by Christ are also established as co-creators with God.

The Christian, as a co-creator with God, does not bring life, or avoid death, at all costs. He does it only in righteousness. He does it only with respect for the inviolate holiness of his fellow man. He does it so that at the end of the day he may see everything he has made and find that it is good.

As Christians, our lives receive their primary definition from the God who first loved us. In the Christian faith we respond to the opportunity and obligation of that love, to love God and our neighbor. That response is prior to all of our professional definitions. The Christian is not a physician or philosopher, scientist or theologian, first; he is a Christian first. As a Christian he has been bound into a covenant with God. He has died with Christ to be given life as one in whom God is working out his new creation.

But what does it mean when a person is also a physician through whom God is working out his new creation? Well, obviously, the Christian physician is an instrument of God's love. He is a physician because he is called through the Church to carry on the healing work of Christ. Salvation is healing, and the physician specializes specifically in the healing of sick and broken persons. He works with the techniques of his science and the skills of his art in order to enable salvation (notice the ancient term for a healing ointment, "salve"! ). And he knows that his patients are also co-creators in God's covenant.

With the development of complex systems of medical care, informed by the possibilities of new technologies, this simple claim has gotten hidden most specifically in debates over legal rights of patients and physicians. For the Christian physician, that is starting at the wrong end. The Christian comes to rights through obligations. And the first obligation is to love God. The second is to realize God's love in loving my neighbor. Faithfulness in that love is the sum of righteousness. Rights are the abstract outlines of the conditions for righteousness. Rights come into being as we care for each other in the love of God. The Christian has been called to love God in a sick and broken world because God first loved him even to the Cross. The Christian physician is impelled to the service of sick and broken patients by God's love at work in him. The Christian patient comes to a physician ready to accept the transforming power of God's loving care.

Christ, as the new Adam, became the first of many brethren -- those who were brought to the responsibilities of fulfilling the intent of the original creation, in the new creation. These are those



called Christian. They feed God's sheep. They care for their neighbors. They are the ones who become physicians with a passion for bringing life into being, discovering new ways of healing, and going beyond the dominion of death. They are the ones who become patients with a yearning for the end of disease, willing to enter the transformation of life, and reaching across the limitation of death. Physicians and patients, they are co-creators with God, in faithfulness to the covenant of holy love.

Thank God the physician does not create alone. He is a co-creator and he is bound by a covenant. He has the responsibility to continue the order of nature, and thereby enter into the mystery of the natural order that sustains creation. He has the obligation to share in the risk of failure, and thereby allow the miracle of a new intervention that continues creation. And he has the joy of helping to realize the inviolable integrity of his patient, who is equally called to be a co-creator with God.

Responsibility, mystery, miracle and joy in creation: these words express the Christian compass of medical ethics. The problem is that much medical practice has been cut off from its Christian genius. The physician's responsibility is not first of all defined by laws, but by the covenant of care. The patient is neither a collection of symptoms, nor a piece of meat with vital signs, he is a fellow co-creator with whom the physician works to enable the mystery of healing. Death is not the final defeat of the armory of medical techniques, but the point at which the wisdom of science surrenders to the miracle by which life is completed in God. The joy of medical practice is not found in a cost-benefit analysis, nor in the momentary triumph of human skills, but in the realization that in everything God works for good with those who love him, who respond to his call to be co-creators according to his purpose.

To allow or not to allow conception in a test-tube -- to clone or not to clone -- whether abortion is right or wrong -- what are patient's and physician's rights -- when and by whom should the plug be pulled -- comprehensive health care vs. responsive crisis management -- patient centered vs. institution centered therapy -- add as many more as you wish -- none will find solution until and unless we recover the Christian genius of medical practice. Western medicine is what it has become because a long line of physicians accepted their responsibility to be co-creators with God. The details of medical ethics came as a living commentary on that responsibility. Physicians reached out to heal ancient ills, and turned aside to study new techniques, because there was first a man on a cross who called them to care. They did not ask what benefits they would gain, what rule they would fulfill, or what victory they would achieve. They simply accepted the responsibilities of participating in God's creative covenant. They went out as Christ to their neighbor, and rejoiced if they gained some benefit and achieved some victory. The rest is history.

I am very much afraid that the institutionalizing and professionalizing of medicine may mean the loss of this primary motivation. Clearly we are tempted to arrogance. Some think that medical science can cure all ills, if only we devote sufficient resources to it. Clearly we are tempted to impersonal legalism. Some think that the physician's responsibility begins and ends in fulfilling legal requirements for providing accurate diagnosis and effective procedures. The first temptation leads to overweening disaster -- playing God. The second temptation leads to self-justifying atrophy -- denying the responsibility to be co-creators with God. But we do not escape these temptations by denying the motivations that made them possible.

Rather, we must recall and enlarge those motivations so that physicians and patients may recognize that the details of medical ethics are a commentary on loving God and our neighbor. As co-creators in the covenant of life, we are responsible to the larger covenant which calls all men to share in realizing the goodness of creation. This is not to do whatever we desire, but to do what is right and to provide opportunities for others to do likewise. Thus we care for each other and acknowledge that each person bears the image of the God who creates through holy covenant. Thus we also know that any failure to treat a patient as a person -- to seek consent and accept judgment -- is not just an error, it is a denigration of the covenant of life.

If we do not accept the fact that we are made in the image of God, with the responsibility to be co-creators with him, then what? We do not escape the responsibility by denying it. Rather, we denigrate the responsibility. We grasp at equality with God. We play God. We become agents of Satanic power. We violate the covenant of life. We end up by destroying creation -- which is to say ourselves and our posterity.

Today's physicians and patients fulfill their responsibility as co-creators in the image of God by sharing in the mystery of continuing creation, entering into the sorrow of disease and death, and being able to say at the end of the day, "This, which we have helped to create, is good." Then, the first question will not be "Is this right?" but, "What is my responsibility?" Then, the conclusion will not be self-justification, but joy in having shared in bringing another day of God's creation to fulfillment.

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### Scientific Interest in the Shroud of Turin

by: Robert Brungs, S.J.  
Director: ITEST

One of the stranger events of our day is the sudden burst of scientific interest in a piece of cloth. This linen cloth has become the focus of much scientific testing this past fall. During Holy Week, 1978, the St. Louis Post-Dispatch carried an excellent week-long series on the Shroud of Turin, which, one tradition maintains, is the burial cloth of Christ, a cloth which contains his bodily "portrait." In July, Science (Vol. 201, No. 4352, July 21, 1978) carried a five page story on the Shroud and on the scientific research being done on it. Science News (Vol. 114, No. 26, Dec. 23 & 30, 1978) has a three-page coverage of this mysterious object. Since the Shroud is being mentioned with surprising frequency, even in scientific literature, it might be well to look briefly at this phenomenon. First, let's look at the Shroud itself.

The Shroud of Turin is a piece of seemingly ancient linen of herringbone weave which has been kept in Turin, Italy since 1578. This cloth is historically traceable by documentary evidence to Lirey, France in 1354. In 1357 this piece of linen was exhibited in the church of the de Charny family there. It was denounced as a painted forgery by the Bishop of Troyes who maintained he knew how the painter had perpetrated the forgery. Since that time the Shroud has been the center of an on-going controversy.

In 1453 the Shroud moved into the possession of the royal House of Savoy. In 1532 the cloth was in a fire as it lay folded in a silver reliquary. The Shroud was scorched by molten silver that left triangular burns along the edge of the figure on the cloth. The Shroud was moved to Turin in 1578 where it is now kept locked in the Royal Chapel of the Cathedral of St. John the Baptist. It was exhibited to the public this past fall on the occasion of its 400th anniversary in Turin. After the exposition was completed it was subjected to many non-destructive testing techniques, the results of which are not yet available.

The cloth itself is linen, 14 feet, 3 inches long and 3 feet, 7 inches wide. It bears the anatomically correct image of a man about five feet, seven inches tall, bearded, his hair gathered into a pigtail. The markings on the cloth portray two images of a male human body, the front and back of the same man.

As has been suggested earlier, the Shroud of Turin has been the subject of a running controversy since it came to light in France in the 14th century. Herbert Thurston, for example, in the 1912 edition of The Catholic Encyclopedia, rather cavalierly passed it off as a painting, despite the fact that Yves Delage, a French agnostic, presented a report in 1902 to the French Academy of Science that concluded that the image could not have been painted since there were no brush strokes and no pigmentation. Unlike other such "relics" that have come down to us, the Shroud of Turin has been exposed to some scientific investigation. The scientific interest in this cloth really began in 1898, when, on the occasion of the marriage of King Victor Emmanuel III, the Shroud was exposed publicly and photographed by a man named Secondo Pia. To everyone's surprise, the image on the cloth was found to be a negative image -- like a photographic negative. Somehow or other the body imaged on the Shroud had "photographed itself" on the cloth.

In 1931 far better photographs were made and this set of photographs were used by a French doctor, Pierre Barket, for a medical examination of the anatomical evidence presented by the image itself. His studies have gone a long way in establishing that the Shroud could not have been a medieval forgery. All the evidence gathered so far from the Shroud itself (no brush strokes, no pigment, a negative image -- obviously an unknown process in the 14th century -- and the precise anatomical detail) disproves completely the contention that it is a painting.

In 1969 and 1973 some further scientific testing was done, but not all that well. This work, sponsored by the Turin Commission on the Shroud, was done entirely by "local experts" who had no access to the more sophisticated equipment that is now available. Nonetheless, a couple of discoveries were added to those that were already available. It was discovered, for instance, by unstitching part of the Shroud from its protective backing, that the image is a surface phenomenon, i.e., it does not penetrate the fabric. Also, it was reported that the fabric can date to the time of Christ. The age of the cloth has not yet been determined accurately. The weave is a herringbone twill that is known to have been used for cotton at the time of Christ in the eastern Mediterranean. No other linen example of this twill is known from that area at that time. But, strangely enough, testing of the cloth has shown that there are cotton fibers among the linen in the Shroud, indicating that this linen was made on a machine used for cotton.

Moreover, pollens in the dust taken from the Shroud have been examined by Dr. Max Frei, the former head of the Zurich Police Scientific Laboratory. He identified 48 plants, of which 16 grow in Italy and France. Others are desert plants, some from Turkey and some from the Dead Sea region. Thus the cloth



was exposed to air near Jerusalem as well as possibly Edessa and Constantinople. The cloth's presence in these places is compatible with its probable history.

Another development, which may well lead to much greater information, has come from the work of two physicists at the Air Force Academy. Drs. John Jackson and Eric Jumper used computer photo-analysis techniques -- like those used to enhance the photographs from Mars. Their results show that the image of the Shroud is, indeed, a natural photographic negative. More than that, it is seen to be three dimensional in character; the darkness of coloration of the image seems to be related to the distance between a particular part of the body and the cloth. They also discovered what appears to be two coin-like objects resting over the eyelids. Better photographs might reveal the exact identity of these objects.

There is a feeling among those working to identify the Shroud that they've gone about as far as they can go with photographs. To make more progress they feel they must work with the scientific analysis of the cloth itself, although infra-red photography and the use of various films and filters might provide pictures better suited to computer analysis.

All the "wounds" on the figure -- the nail wounds, the crown of thorns, the lance wound in the side, etc. -- show what could be blood stains. There have been tests made to see whether these stains contain blood residues. So far these tests have been negative. Preliminary fluorescence work has shown that the image itself, the scorch marks and the "blood stains" all fluoresce. This has raised a serious question since blood does not fluoresce. But according to one expert, these preliminary tests did not involve even the most sensitive reagents that were available when they were made. New tests include spectroscopy, x-ray fluorescence, x-ray transmission, and infrared thermography. It is hoped that this battery of tests can distinguish among the metals in blood, sweat, dyes, aloes, and myrrh.

One of the key questions that remains to be answered is the age of the cloth. Obviously carbon-14 dating can be done, and this is a destructive test. Current carbon-14 dating techniques require a larger sample of material than the Shroud's custodians are willing to have destroyed. But a new method is anticipated. This technique would use a linear accelerator and theoretically would require a sample only as large as a one centimeter length of a single thread.

All in all, the growing mass of scientific data -- as was true also in the work of medical and anatomical analysis that was done by Dr. Pierre Barbet -- leans toward the authenticity of this relic. All of the scientific information accumulated in the last eighty years tend to support that tradition which holds that the piece of cloth in Turin is the burial cloth of Christ. That is to say that the internal evidence from the image itself is not inconsistent with the New Testament and the Christian tradition.

But there are still several levels of questions to be answered. First, of course, is the question of the age of the cloth -- this can be answered scientifically. Another question that maybe can be answered by scientific techniques is how the image on the cloth was formed. No presently known method accounts for the image. A further question concerns the meaning of the cloth, if indeed, science does not disprove its authenticity. That will be a faith-question and obviously will require a faith-answer. But there is also one other question that cannot be ignored.

One of the reasons that Herbert Thurston could be so sure in his dismissal of the authenticity of the Shroud is the lack of historical witness before the mid 14th century. Documentary evidence gets us back only to 1354. If such a relic is so precious, indeed, why do we not have evidence of its existence before then? Such, in essence, is the central element of the historical argument against the authenticity of the Shroud as the burial cloth of Christ. It has been said of the Shroud of Turin that it is like a three-legged table; its vital fourth leg is missing so completely that it will not stand up.

Various attempts have recently been made to plug the gap of 1300 years in our knowledge of the Shroud. These attempts have not been completely satisfactory and it is doubtful that after all these years a truly satisfying continuous record of the history of the Shroud can ever be given. Too many records have been destroyed -- such as the records of the relics stored in Constantinople before it was sacked by the crusaders in 1204. Moreover, if the Shroud were authentic, such a precious relic of a man who was condemned to death as a revolutionary, a criminal, a blasphemer, whose followers were persecuted on and off for three hundred years as atheists and enemies of the State -- such a relic would have been hidden carefully in order not to be traced. Furthermore, we should expect it to have been hidden again during the Iconoclast persecution in the Eastern Empire in the 8th and 9th centuries. This heresy declared that the veneration of images and relics was blasphemous and these images and relics were destroyed when found. Certainly if the Shroud of Turin had existed then it would have had to be hidden to protect it.

It is possible that the Shroud of Turin came to France from Constantinople. There exists some reason to believe that the Shroud was part of the "spoils of war" taken from Constantinople when it was captured and burned by the soldiers of the Fourth Crusade. It is certain that there is no hard evidence of the Shroud before the beginnings of the 13th century. Where does all of this leave us? It would be well to look at where all the physical evidence gathered and the lack of historical evidence lead us.

First, the internal evidence (namely, that gathered from the cloth itself and from the image) lends credence to the authenticity of the Shroud. The lack of external evidence (the gaps in the historical record of the Shroud) tends to inhibit our acceptance of that authenticity. But let us note this: the physical analyses still to be undertaken can disprove the authenticity of the Shroud as the burial cloth of Christ and of the image as that of the Lord. For instance, take those things that look as if they might be coins put on the eyelids to keep them closed. Assume that further analysis clearly shows them to be coins. Further, let us make the hypothesis that these coins can clearly enough be defined as second century A.D. Roman coins. This would, of course, completely disprove the authenticity of the Shroud as a "relic" of Christ, since, clearly, there were no second century Roman coins in circulation in first century Palestine. Or, again, carbon-14 dating techniques might show that the cloth dates from no earlier than the fourth century. This quite obviously would disprove the claim that this is the burial cloth of Jesus.

If, on the other hand, all the data from all the conceivable scientific analyses of the cloth shows that it is from the right time, was in the right place, and so on, this still does not prove that this was the cloth in which Christ was buried, although it would represent a very high probability that it was. At most, all that that information could prove is that a man, who was crucified in the manner in which the New Testament tells us Jesus was crucified, was buried in that cloth in Palestine in the 30's of the first century. No strictly physical evidence at this time can prove -- in the strict sense of prove --

that this is the authentic burialsheet of Christ. But scientific evidence can disprove it.

So, too, with the situation of historical evidence. The lack of a total, continuous historical record does ~~and~~, and cannot, disprove the authenticity. It all comes down to this: it is unlikely the Shroud of Turin will ever be proclaimed authentic unless some miraculous events are clearly connected with it. Evidence solely from the human sciences will be insufficient for such a proclamation reasonably to be made.

Beyond what science can tell us, the Shroud of Turin raises some interesting questions for Christians. Suppose for a moment that the Shroud is authentic, i.e., that the face and form on it is indeed that of the Lord Jesus. What purpose would such a relic have? Why did God give it to us? What does it mean for us? Why are we discovering that authenticity in the last years of the twentieth century? Why does the image on the cloth seem to be fading? These questions -- and their answers -- are not essential to our faith in the Risen Lord? But they are quite intriguing. It might be something for some theologians to ponder.

Barbara Culliton summarized her article in Science by saying:

And so it seems likely that modern science and religion may soon meet in a cathedral in Turin, with no outcome guaranteed. The circumstantial case for the Shroud's authenticity, while intriguing, is hardly compelling. In the light of the fact that it has been largely inaccessible to scientific researchers, it must be noted that some of the existing "data" about its features could prove to be incorrect; in any event, no final judgment will be possible until the cloth is accurately dated and carbon-14 dating is at least a couple of years away. Furthermore, it could turn out that sophisticated scientific examination will reveal new information that explains how the image was made.

Still, Rogers (Ray N. Rogers, the thermal chemist and spare-time archeologist from the Los Alamos Scientific Laboratory), in a philosophical frame of mind muses, "What better way, if you were a deity, of regenerating faith in a skeptical age, than to leave evidence 2000 years ago that could be defined only by the technology available in that technical age?"

One thing is certain even now: whether or not the image on the Shroud is the portrait of Jesus Christ, it is a most mysterious piece of cloth.

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Excerpt from the talk of Dr. Rustum Roy (Penn State) at the November, '78 ITEST-NASA meeting

First, I'm going to say to you that there is no scientific evidence that any particular funding level is good or bad for science. Please, let me repeat that. I am saying that it doesn't really matter how much money you put into science. It is not at all evident that cutting the budget in two would be bad for science. Please hear what I'm saying. I'm saying that we cannot prove scientifically that it would not be good to cut the budget in two. Nor can we prove that it would not be better if we doubled the budget. Neither of these statements can be proved. So any scientist who panics at the thought of relatively minor changes in the budget is simply unscientific.

Let me make the proposition that we should cut the absolute budget in two. But let's keep all the scientists employed. If we kept all the scientists employed, they would have less money, less equipment and fancy do-dads, and less computer time. Would this hurt science? How do we know? Maybe they would spend some time thinking instead of hustling bucks. People might actually get to the point of doing something creative about new problems in which Washington shows no interest and from which society might really benefit much more.

Let me make the further invidious suggestion that we might take away half the budget of the physics community and give it to the biologists. Who is to tell me that it is not ~~again~~ rather than a loss? I know the physicists would say it was a loss, but how does society make that judgment? It doesn't make the judgment. You are going to hear something very strange in a minute. I won't give away that deep secret just now. But the first secret is that we really could cut the budget within, say, a factor of two. Nothing would happen to science -- absolutely nothing. Science would proceed. Different things would be done. I am not challenging Congress to cut it in half. But I am suggesting that that is not the dire peril in which science stands.

Let me give you a story about that. Einstein, when he graduated from the Federal Technical Institute in Zurich, was a mediocre student who barely made it through.... So Einstein sat in the Patent Office and did his most profound work. Certainly he did a large percentage of his profound work in eight years while he ran through patents for the Swiss Patent Office. He was a tent-maker, like St. Paul. He paid for his own science. To suggest that science needs enormous funding is only to suggest that some kinds of science-- the product of which is of dubious value -- is essential, while others are not as good. I suggest that is wrong. There is no evidence for that.

When I say that we don't know what budget level is good for science, that makes a harsh sounding statement and it opens the door for lots of other things. I am not suggesting that we should proceed in one direction or the other, but we should eliminate the threat of this budget crisis as being the main way to judge society's love or hate affair with science. ... (T)he setting of science's directions -- and by that I mean also its priorities--is a terribly undemocratic process. Why we do particular kinds of science is a totally feudal, hereditary problem.... The only reason we do so much physics is because... the physics community delivered an atom bomb. They could do no wrong and, therefore, we spend hundreds of millions of dollars for accelerators.... So who sets scientific priorities?.... Does the Congress? Does the will of the people? No! Is there a body, like the National Academy of Sciences, that votes? that has intellectual debate? No! None of that! How is it done? It is done by the principle that what is good, and that "them who has the gold makes the rules" that's the Golden Rule: "Them that has the gold makes the rules."