



BULLETIN

DATE: AUTUMN, 2000

VOL: 31 NO. 4

School has begun. In fact, we are really in the middle of teaching and explaining. But before we're teachers and explainers, we're searchers after the Truth. We can never say that we have arrived at our destination, which is the Truth, until we see Him face to face. Even then we will not know Him as well as we will later — at least according to Saint Gregory of Nyssa.

Gregory uses an image of a spiral: seeing Him we will begin to know Him and knowing Him better we will love Him more and loving Him more we will know Him better — in an ascending spiral forever. What a breathtaking thought! But we will know Him as a human being with a body — always with a body — as we are bodied. His body and ours in a never-ending dance of love! Our bodies will know Him better and love Him more — and His body will be in union with ours.

It is fitting then, as we prepare to search for more truth about our bodied existence, we contemplate the end of that life, temporary though the end might be. Whether there is an immediate resurrection of our bodies or not we'll learn when the time comes. It seems to me now that there is such a resurrection, but what do I know? Certainly nothing about my own eschaton! But the search continues — as it should.

One thing seems clear: the body is more important to our salvation than we usually credit. Every deed we do as human is done in the body — good or evil. Every thought we think, every dream we have has its origin in the body. We cannot serve God nor love Him apart from the body. I won't impute to you the thoughts in my mind, but I must continually remind myself how important to my salvation the body is. Maybe I should just end these wanderings with a salute to the body with a hope that the October meeting on *A Theology of the Body* was a roaring success. Until the future, then, I salute all you bodied persons and look forward with you to a stunning future. God be with you.

Robert Brungs, S.J.

Page 1	DIRECTOR'S MESSAGE
Page 2	ANNOUNCEMENTS
Page 3	THEOLOGICAL IMPLICATIONS OF VIRTUAL REALITY by Sister M. Timothy Prokes, FSE.
Page 8	COMMENTS & QUESTIONS
Page 11	NEAR-EARTH ASTEROID RENDEZVOUS by Sister Mary Ellen Murphy, RSM
Page 13	FROM Theology: Method and Content by Joseph Murphy, S.J.
Page 17	NEW MEMBERS, etc.

The ITEST Bulletin: Publisher, Robert Brungs, S.J.; Editor, S. Marianne Postiglione, RSM

ITEST Offices: Director, Robert Brungs, S.J.
Director of Communications, S. Marianne Postiglione, RSM
221 North Grand Boulevard
St. Louis, Missouri 63103 USA

ANNOUNCEMENTS

1. Keep your calendars open for the October, 2001 workshop/conference on the topic of "**genetically modified food.**" We don't have a confirmed date yet, but it will most likely be during October in St. Louis with what promises to be an exciting and challenging weekend. In any event we will keep you updated on this "neuralgic" topic.

At the time this bulletin goes to press, we are still focused on this year's October workshop: *A Theology of the Human Body*; however, our eyes are already on next October. We have applied for supplemental funding and have contacted possible essayists and/or speakers; our search is still open for additional qualified people in this area.

We need philosophers, sociologists, theologians, "food" scientists, technologists, agricultural and soil scientists among others, to attend the conference and to contribute not a prepared paper necessarily but their own views and knowledge based on their experience in the area. Have you studied or read about genetically modified food? What is your response to questions of the science involved in genetically modifying seed, for example, safety issues, labeling products, consumer protection? These are some of the questions we plan to discuss among many others.

A caveat: The ITEST Staff and Board of Directors have designed this weekend conference/workshop to allow for expression of multiple views. We do not propose to take a stand "for" or "against" genetically modified food; rather, we intend to listen to each other, interact in formal and informal sessions, and gather information and insights from the presenters and participants. The edited book of Proceedings published after the conference and distributed to ITEST members, workshop participants and media outlets will provide an alternative to the hysteria which often accompanies discussions of genetically engineered food.

If we indeed are successful in obtaining supplemental funding for this workshop, we will have the means to advertize in the print and electronic media.

2. Just a reminder! Let us know if you have received an award or recently published; we will announce it in an upcoming bulletin. Also, the editorial staff, with proper reviewing, accepts papers for publication in the *Bulletin* as well. Deadline for submission of articles for the Winter Bulletin is December 1, 2000.

3. Once again we remind you to access the ITEST Web Site for all the major articles published in the ITEST Bulletin from 1999 through 1996. Our long range plans are to have articles from all ITEST bulletins on the Web eventually. That will include issues from 1999 to the 1980s and possibly the 70s. We thank John Matschiner for his

generosity and invaluable assistance in readying material for the Web Site by providing formatting in html. We have heard from people who have used the articles and find this service quite helpful. Finally, we have reconfigured the web site slightly to make it a little easier for people to find material they are researching. Let us know if you have any suggestions.

4. Just recently we received a request for copies of the publication *Readings in Faith and Science* (1997), a discussion guide for campus ministry and adult education or parish discussion groups and available for purchase at \$6.95 each (discounts for orders over 5). Although *Readings* has a publication date of 1997, it is still very much up to date and "discussable." A review of *Readings* appeared in the Feb., 1998 issue of *Initiatives*, the newsletter of the National Center for the Laity, based in Chicago. The reviewer stated, "Throughout (the book) the relationship or lack thereof between the religious community and the scientific community is taken seriously and the influences of the two communities upon each other are considered in detail." Finally, "The overall thrust toward mutual benefit (science/religion, science/faith) communicated in these articles is wonderfully refreshing."

You might want to consider using this book for parish discussion groups.

5. **MEMBERSHIP DUES:** Within the next few weeks you will be receiving a letter reminding you to renew your ITEST membership for calendar year 2001. As you will note, dues will be \$50.00 (USD) and \$25.00 (Student rate). This is the first time in four years the ITEST Board has raised dues; increases in postage and printing costs have dictated this move on our part. Again, we ask you to be generous and contribute that "little extra" toward the work of ITEST in the area of sci/tech encountering faith/theology. Alternate methods of payment of dues:

a. *Western Union* — Overseas members may pay via Western Union. Although retrieving the payment is an inconvenience for us, we accept this method of payment.

b. *Check* — Many overseas members use this method of payment. However, the check must be drawn on an American bank and must include the "routing numbers" on the check. If the bank neglects to use the routing numbers, our bank cannot process the check. Our bank then, either, 1) returns the check to us, or 2) sends it to a designated bank for collection thus charging us a 60% fee. There is no problem with checks or money orders from members within the continental United States.

THEOLOGICAL IMPLICATIONS OF VIRTUAL REALITY

Sister M. Timothy Prokes, FSE

*[Sister Mary Timothy is Professor of Theology and Spirituality at Notre Dame Graduate School of Christendom College, Alexandria, Virginia. She also teaches in the Permanent Diaconate Program, Archdiocese of Washington, D.C. She is the author of *Toward a Theology of the Body*, 1996 as well as several other books and scholarly articles. This paper was given at the ITEST Workshop on March 11, 2000.]*

I am grateful for today's excellent expositions of technical aspects of virtual reality. When expertise comes out of personal experience, it is especially helpful.

Today I simply want to place some basic questions regarding virtual reality. Without hesitation, I think there is no greater issue emerging for the Church in the next couple of decades than virtual reality. I also think that its immense implications for faith life remain largely unrecognized and I do not see that theologians generally are considering it a major issue. So, what I would like to do today is to open serious discussion of virtual reality from a theological perspective — to begin a dialogue. I think that ongoing developments involving virtual reality impact both our understanding of divine Persons and our understanding of what it means to be a human person. Virtual reality influences our response to the realities of Jesus Christ's Incarnation, Redemption, Resurrection and, indeed, all sacramental reality. In this brief time, I wish only to raise core issues within a theological context that is intimately bound up with daily life.

Virtual reality "comes home" in rather simple ways. We already live in an environment that is increasingly "virtual." During the past Christmas season we had guests on two successive evenings, and had prepared log fires in the fireplace. On the first evening, when two women guests entered the living room, they asked with some surprise: "Is that a *real* fire?" I was struck by that. People today are more accustomed to find *simulated* log fires in fireplaces so that a real log fire surprises them. The next evening we again had a log fire. Once more, the guests asked "Are those *real* logs?" Moments like that make us realize how much we are immersed in the virtual.

Last summer *The Washington Post* published a special section on "smart houses," which are already "wired to the gills" as they put it. They spoke, for example, of Bill Gates' home. Among other novel features in it: music to fit one's tastes. Depending upon the "indicator" that a person wears as they enter a room, music changes to suit the individual. In the home of the future, the article noted, there will be entire walls of

liquid crystal, and there will be constant movement and change. Medicine cabinets will remind us when to take our medications. "In theory," a reporter wrote, 'your English muffin will be able to communicate with muffins throughout the nations of the former English empire. The truly smart house won't sit around waiting for orders from the boss. You want a refrigerator that not only detects when you're out of milk and orders another gallon, specifying 2% milk fat, but one that goes the extra mile, discovering that behind the half-used jar of Ragu, there lurks rice pilaf that is rapidly and catastrophically degenerating into a bacterial metropolis. And you want the fridge to flash the headline on its visual display 'microbial Manhattan behind Ragu.'"

Why should these be matters that raise theological questions? I suggest: if theologians generally are not thinking in those terms, those involved in research and development concerning virtual reality are. Consider a few book titles by those reflecting from within study of VR: *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics* by N. Katherine Hayles; *The Physics of Immortality: Modern Cosmology, God, and the Resurrection of the Dead*, by Frank Tipler; and *Whatever Happened to the Human Soul?* by Warren Brown et al.

In specifying what is encompassed by the term "virtual reality" I realize that we are already dealing with it in primary ways that John Cross spoke about earlier today. There is already, he noted, a virtual aspect to the way in which we perceive. What I am referring to, however, accords with a definition given by Michael Heim: "*Virtual reality is an event or entity that is real in effect but not in fact.*" Heim says that there is no general agreement regarding a definition of it or what constitutes its essential components. He distinguishes seven descriptions, acknowledging that there is a great variance among them. He begins with a lesser level — simulation — and moves toward the more complex expressions of virtual reality. I am going to summarize them briefly, staying as close as possible to his descriptions.

The first is *simulation*, meaning a seeming degree of

realism with sharp visual and sound images. Military flight simulators are an example. The second is *interaction*. For some people, virtual reality means any electronic representation with which they can interact. You can see how broad that description is. But Heim gives a helpful example: the interaction with "icons" in computer programs that provide familiar language and images. Heim says that we speak of the small computer window as a "desktop" and then we *as it were* drag files across it and dump them into a "trash can."

Heim reflects that, as adults, outside of that small computerized situation we really don't even *talk* that way! It's very imaginary in that sense. But, we interact — so when we interact, it makes sense. That interaction, however, includes virtual persons, a television, and computer networks. It includes virtual universities where on-line students attend virtual classes in virtual classrooms and socialize in virtual cafeterias. This opens to a third description of virtual reality: *artificiality*. Our whole environment is so wired, paved and otherwise reconstructed that we can say we live in what can be termed an "artifice" of human contrivance. A straight-faced advertiser can tout a product as "genuinely simulated walnut."

Fourth — and this gets deeper now — there is *immersion*. Hardware and software configurations are growing in sophistication. The object here is sensory immersion, or sensory immersion in a virtual environment *in order to cut out visual and audio sensations from the real world and supplant them with computer-generated sensations*.

A fifth descriptive word for VR is *telepresence*, or robotic presence. I like Heim's description because he makes us think of the implications. He writes: "To be present somewhere yet present there remotely is to be there virtually." In other words, it is real-time effectiveness in a real-world situation without being there in the flesh. An example: a doctor works in a patient's body while not being present where the body is located.

A further possibility of VR is called *full-body immersion*. Myron Krueger, who is sometimes called "the father of virtual reality" uses equipment that, in a manner that can interact with graphic images and objects on a screen. I don't know if any of you remember seeing the film *The Purple Rose of Cairo*. In that film a woman who has a fascination for a particular actor attends the movies each night after work in order to see him. One night, the actor steps out of the screen and begins a relationship with her. The film was prophetic of future developments in *virtuality*.

The seventh description of virtual reality is termed *networked communications*. Heim cites "RB2," reality-built-for-two systems that connect virtual worlds so that more than one can interact within a virtual world or worlds. It is interesting to note that his book bears a 1993 copyright. Think of all that has already far exceeded projections of that time!

In light of these descriptions I would like to raise three significant theological concerns. In doing so, I have no desire to return to a former era. Theologically, it is essential that we be in relation to what is happening in this moment of human history and to discern what the genuine issues are. How does "faith seeking understanding" relate to virtual reality? It is from that basis that I raise these three theological concerns. They involve 1) real body-person; 2) real presence; and 3) real freedom.

Real Body-Person

In speaking of *real body person*, it is necessary to recognize and appreciate that imagination is one of the major inner gifts of human persons. All of the arts depend on it. Even our capacity to meditate, to form analogies, to appreciate the beautiful, and to project scientific and technical possibilities depend upon this gift. Concomitantly, there has to be a concern for the manner in which the gift of imagination is thwarted and distorted in many children today - partly through the advertising world that is foisting products on children that pre-condition their understanding and attitudes concerning the body-person. Many ads portray the body as defective, needing outside intervention to "fix" it. The real body is portrayed as a liability or a defective product.

In that sense, we are immersed in a new form of docetism, which was one of the major problems for the early Christian Church. *Doceo* means "to seem." You can see the great Christian struggle against docetism already in the Letters of John. The first letter emphasizes the reality of Christ come in the flesh and the reality of all that He had accomplished. The docetists wanted to bypass that; they claimed that he only *seemed* to be and do these things. Some of them rejected the idea that He was born, and certainly the reality of his suffering and dying. These human, bodily realities were considered unworthy of Him, and distasteful.

Recall that virtual reality is *real in effect but without substantial existence*. In our culture we are experiencing a blur between the real and the virtual. It is a boundary that is easily trespassed, and many often eagerly seek to do away with all boundaries. This is

not hypothetical. On the Internet recently, when I was looking for materials on VR, I came across information from a researcher who, in describing his work-in-process posted that "the second phase of my thesis will be to develop a software-controlling module for autonomous virtual humans." At LIG several researchers are developing "virtual humans" with synthetic perception modules. The main objective is to let humans interact with autonomous virtual objects and humans "in a natural way."

This issue is taken up well, I think, by N. Katherine Hayles. Her book is one of the most thoughtful that I have read on VR. She discusses the field in terms of what she calls "the post-human." She points out that already in the 1940's and 50's at the Macy Conferences on cybernetics, a new paradigm was shaped. She writes: "Henceforth, humans were to be seen primarily as information-processing entities who are essentially similar to intelligent machines." She said that it's not for nothing that "Beam me up, Scottie" became a cultural icon for the global informational society because it really expresses that in a powerful way. Already in the 1950's Norbert Wiener proposed that it would be theoretically possible to "telegraph a human being." My theological concern regarding real body-person comes to a focus here. Hayles says: "Star Trek operated from the same premises when they imagined the body can be dematerialized into an informational pattern and re-materialized without change to a remote location."

In relation to this, Hayles cites Marshall McLuhan who decades ago observed that electronic media would have the capacity "to reconfigure" so extensively "as to change the nature of man." Theologically, these cryptic observations touch basic theological issues. Jesus Christ, the Second Person of the Trinity, the Word, didn't come into this world as a disembodied packet of information. It was in His daily self-gift in a lived body that he knew joy and suffering. He knew all the exigencies of what it means to be expressed in a human body. He did not escape that. If, in faith, we affirm that we are to be at one with Him, there is need to ask from the basis of faith seeking understanding: are we becoming capable of creating a rift *bodily* between the Incarnate Christ and ourselves? This is a crucial issue.

One of the most frequently quoted passages from the documents of the Second Vatican Council is Article 22 from *Gaudium et Spes*, the *Constitution on the Church in the Modern World*. The document underscores the reality of the Incarnation and its meaning for all humanity: "It is only in the mystery of the Word made flesh that the mystery of man truly be-

comes clear. In a certain way he has united himself with each person. He worked with human hands, thought with a human mind, acted with a human will and with a human heart he loved. Born of the virgin Mary he has truly been made one of us, like us in all things except sin.

It is interesting to note how the Gospel narration of Jesus Christ feeding the multitudes leads to His stressing "my body is real food and my blood is real drink." Once that is lost, the sacraments (especially the Eucharist) become "virtual." Some years back, it was said (I am not sure if the story itself is apocryphal - virtual) that a marketing planner for Coca-Cola heard a song that had been destined to be a Eucharistic hymn. The company purchased the rights for it, however, and the rest is history. Coke was successfully touted as "The Real Thing." Remember? There is within us a longing for what promises to be "the Real Thing." There is in Christ the authentic promise of the Real Thing. Theologically, this has particular significance. In the sacramental language of the Church, there is a manner of expressing the reality of Christ's efficacious presence and activity in the Sacraments: *res et sacramentum*. The Latin phrase means "the Reality and the outward sign." It means "the Real Thing" made known through perceptible material realities and words. Great care has been taken to emphasize that sacraments are not mere simulation, not artificial representations nor effects produced by an absent, distant agent. The theological significance of real body-person is basic.

It is important, then, as we deal with masterful technologies, especially those involved in the creation of "virtual persons" (disembodied illusions of persons that nevertheless are intended to affect and interact with us just as real people in the real world) that we are aware of what we are doing. Heim writes: "Our bodily existence stands at the forefront of our personal identity and individuality. Now the computer network simply brackets the physical presence of the participants by either omitting or simulating corporeal immediacy. Bodily contact becomes optional. You never need stand face to face with other members of the virtual community. You can live your separate existence without ever physically meeting another person." We can see how those in the research community are dealing with issues that vitally touch upon real bodies, community and yes, the Eucharist.

N. Katherine Hayles says that the "post-human" view has the following assumptions. *It privileges information patterns over material instantiation*. In other words, *pattern and information become superior to any material or bodily instantiation*. Consciousness becomes the ba-

sis of human identity. A third assumption: the body is considered the original prosthesis that we all learn to manipulate from this viewpoint. A fourth post-human assumption: "It configures human beings so as to be seamlessly articulated with intelligent machines."

Once the human person is judged to be essentially information, boundaries are gone. Marvin Minsky suggests that it will soon be possible "to extract human memories from the brain, import them intact and unchanged to computer disks. Because of that information we have constructed, we will have achieved immortality." It is evident that serious questions are involved, touching upon crucial matters of Christian faith and the theology seeking to understand more deeply.

I don't know if you have seen some of the films which have virtual reality as a core theme. Have you seen *The Matrix*, for example? It is sci-fi and placed in the future, but it makes one think. "Neo" is literally "plugged into" in a computer-generated world where "Morpheus" is a sort of guide. Neo asks Morph: "Right now, we are inside a computer program?" Morph replies: "Is that so hard to believe?...Your appearance now is what we call *residual self-image, a mental projection of your digital self.*"

Neo stammers: "This, this isn't REAL?" Morph replies, "What is real? How do you define real? If you're talking about what you taste and see, then *real is simply electrical signals interpreted in your brain.*" Neo is shown row on row of what seem to be embryos connected to a swirl of cables, and he is told: "*Those are fields where human beings will no longer be born, but grow.*" Neo is also assured that "as long as the Matrix exists, the human will never be free."

There is an eerie ending to the film. There's the image of a computer screen and a disembodied voice says:

"I know you're out there. I can feel you now. I know you're afraid. You're afraid of US. You're afraid of change. I don't know the future. I didn't come to tell you how this is going to end. I came here to tell you how it's going to begin. I'm going to hang up now and then I'm going to tell these people what you don't want...a world without YOU. A world without borders or boundaries. A world where ANYTHING is possible. Where we go from there is the choice I leave to you."

That's heady stuff. St. Paul reminds us that we are not just our own. We have been bought, and at a great

price. From within a faith perspective we have to ask: are we called to inhabit computer disks or to find our immortality in little grey boxes with liquid crystal faces? These are not idle questions. In the call of faith, we are never to lose the sacredness of "This is my Body given for you." That brings us to the question of Real Presence.

Theological Significance of Real Presence

Living intimately with the Eucharist, we speak of "Real presence." A virtual sacrament or an absent Christ would completely undercut the reality of "This is My Body given for you." N. Katherine Hayles says: "Frankly, I can attest to the disorienting, exhilarating effect of the feeling that subjectivity is dispersed through the cybernetic circuit." What of an interface whose boundaries are defined less by skin than by feedback loops connecting human person to artificial others? Hayles says: "Questions about presence and absence do not yield much leverage in this situation." It becomes a kind of non-issue: are you really there, or aren't you? In fact, Hayles observes that "a paradigm shift is occurring from presence to absence."

Sydney Palmer, a woman who has recently completed her MA thesis at Louvain University on *Fides Quaerens Corpus* (Faith Seeking a Body) underscores the need to see in a new light the usual understanding of theology as "*fides quaerens intellectum*" (faith seeking understanding). In pointing to the contemporary need for faith to "seek a body," Palmer studies the significance of touch and upright posture as analogies to Trinitarian perichoresis - the inner life of God. She deals with the significance of skin and touch in relation to divine life. Palmer writes: "Boundaries give space to develop our uniqueness as a gift. They open possibilities. Boundaries are an interface that allows an interaction to happen and a relationship to be built. They mean that someone can enter and that otherness will be respected and not just diffused or absorbed."

Since we are called to union, pseudo forms of interchange without real presence can be very enticing. We know that, and see how that is impacting in a special way upon young people. It's like "cheap grace." It is like obtaining the seemingly possible — and yet, not the "real thing" — whereas sacramental presence involves an interface that is non-invasive, that does not stifle or absorb our will. At the Last Supper, John writes how Christ described interface, and how one moves authentically through a boundary: "You must believe in me when I say that I am in the Father and the Father is in Me. Make your home in Me as I make mine in you." That is the ultimate in personal

indwelling, in communion with the Trinity.

I would suggest that if there is indiscriminate application of the technical possibilities of virtual reality (and if we are not cognizant of what is happening) the following theological concerns are evident: the identity of divine Persons; the meaning of enduring truth, the significance of embodiment, the permanence of personal relations, sacramental reality and Real Presence. Virtual reality impacts upon all of these in some way.

Sacraments are for embodied living persons and they effect real transformation, because there is an intrinsic unity between what is symbolized in the sacrament and the real presence of Divine persons that makes them effective. The Fathers of the Church emphasized that whenever anyone baptizes, it is Christ who is present and baptizing. The matter and form are real, and the divine effective presence is real.

The Significance of Real Freedom

A third aspect for theological concern regarding virtual reality is "real freedom." In Chapter 8 of John's Gospel, Jesus tells his followers: "If you make my word your home, you will indeed be my disciples. You will learn the truth and the truth will make you free." When Jesus said that, his listeners asked what He meant by that. They averred that they had never been slaves to anybody. What do You mean: "We will be free"? Jesus replied: "I tell you most solemnly, everyone who commits sin is a slave." That cryptic exchange signals several things. First of all, there is such a thing as enduring truth. Secondly, there is a direct relationship between truth and freedom. Third, Jesus assured: "I am the way, the truth and the life." Dwelling in His truth makes one free. Fourth, it is possible to be self-deluded: to think one is free when one is not. It is not surprising, I think, that Pope John Paul II keeps speaking about "the truths of being." Are you aware how often he uses that phrase? In document after document, he speaks of the truths of being, that we need to understand and respect.

It is in that light that Heim's observation about systematic consistency taking precedence over direct human experience needs to be considered. He writes: "Note already one tell-tale sign of info-mania. The priority of system. And when system precedes relevance the way becomes clear for the primacy of information. For it to become manipulable and transmissible as information, knowledge must first be reduced to homogenized units. With the influx of homogenized units of information, the sense of overall significance dwindles. Today, logicians like Willard von Orman argue that a concrete and unique individual thing has no

more reality than to be the value of a variable. At least when we consider things 'from a logical point of view'. The modern logical point of view begins with a system, not with concrete content. In that sense of reality and real freedom, *hypertext* (somebody mentioned that this morning) which allows one to leap through the network as if in an eternal present, makes one seem to have a kind of godly view. It's the godly feeling of having all references to a word or phrase simultaneously available to be called up. Heim says, however, that total information is the illusion of knowledge. We can hop around at the speed of thought through a tide of information without any fixed center to organize it.

Gibson says that we can begin to *inhabit* cyberspace. He calls this "consensual hallucination." We don't even realize sometimes that we are being trapped in our minds and cybersystems. A few weeks ago I received a letter from one of our Sisters in Michigan who works with youngsters who come from the inner city to experience realities of a farm in the context of a large child center. Children come to experience animals, the land, plants — to get some reality orientation because so much of their lives isn't that way. She wrote of a group of eighth graders who had come for a plant study. She said they were wonderful in knowing correct scientific terms and could use them. They had no idea, however, how these terms related to the reality of a plant. Photosynthesis and other terms - these they knew, but were unable to relate them to a real plant, of putting it all together.

Another group had come to "plant bulbs." On the way to the garden she overheard them talking and realized that they thought they were coming to plant light bulbs because they were the only "bulbs" they knew! The saddest group, however, were the youngsters who came to the farm on a day that two steers had been slaughtered for food earlier in the morning. Although the blood had been carefully washed from the concrete in front of the barn, a small residue of blood was seen by the children as they passed the barn to a planned activity. They stopped, horrified by the small evidence of blood. It seemed to them a horrible thing that animals would be slaughtered for food! Their teacher, a man, said that he could not believe their reaction because three-fourths of the children had actually witnessed shootings, knifings, murder — they had witnessed in terms of human person. Yet, in terms of animal life, they were unable to understand it. There was a lack of integrated understanding — what is real, and how do real things get prioritized? There is a tremendous blur. That is a significant theological concern. It touches the capacity to be truly free.

There is a desire today to make members of various scholarly disciplines and research capable of communicating through common terms and understandings. The word *consilience* is a beautiful concept, signifying the concept of trying to bring the gifts of multiple disciplines to a common truth. For some, however, it means searching for the lowest common denominator. When precedence is given to system and to conformity of access — to available packets of information — there is the danger of losing the relational and losing the truth in a reductionist web. When it is thought, for example, that the human person can be explained totally through genetics or neurobiology — then our great human capacities for thought, willing, and love, as well as for emotional response, are explained by scientific processes. When that happens, the deeper realities can be lost for the sake of common dialogue.

In the book, *Whatever Happened to the Human Soul*, essayist R. Anderson says: "today some theologians don't want to talk about a soul; it embarrasses them." There is a greater readiness to speak of in general of "spirit." In contrast, *The Catechism of the Catholic Church*, #366 expresses the Church teaching that every spiritual soul is created immediately by God. It is not produced by parents. It is immortal. It does not perish at death and it will be re-united with the body at the final resurrection.

It can seem so good to say: well, maybe we can just talk about "spirit" generally. It is essential to say, "Now, wait a minute." Karl Rahner reminded us of the depth of mystery. A mystery is not something that needs to be "fetched," he wrote. It is already *what we*

are. Only when we begin to appreciate that, he said, can we be open to understanding the more sacred ground of the Incarnation, Resurrection, the Eucharist, and eternal life. In I Corinthians, St. Paul said: "If Christ has not been raised, then our preaching is useless, our believing is useless and we're shown up as witnesses who have committed perjury before God because we swore in evidence before God that he has raised Christ to life. For if the dead are not raised, you are still in your sins. What is more serious, all who have died in Christ have perished. If our hope in Christ had been for this life only, we're the most unfortunate of all people. But Christ has in fact been raised from the dead, the first-fruits of all who have fallen asleep." Paul writes of real body, real presence, real freedom.

In this brief time I have merely raised a few basic theological implications of virtual reality but they are immense as we move into them ever more deeply. The Church needs to be engaged in these issues. When I say "Church" in this regard, I mean us, people in every discipline and especially theologians who need to take these issues seriously. I repeat what I said in my opening remarks: I think that virtual reality will bring the most crucial issues for the Church in the coming decades. Today we are not simply tasting of the tree of life beyond any boundaries - we are also planting endless illusory fiberglass trees without relation in a new technological Eden. This should make us thoughtful. I do not have technological answers. What I am trying to say is that virtual reality raises immense theological issues.

Thank you.

COMMENTS AND QUESTIONS

[At various stages of the meeting the floor was opened to questions from the participants. These have been edited down to just the main gist of the questions and answers. They are all placed at the end, no matter where in the program they occurred.]

ASHBY: Technology is a part of our tool set. Our children have grown up with it and don't see it as something external. In many ways this represents a great human problem. Adults think of this change as evolutionary; the children think of it as part of their environment. Think of your grandparents and the changes they have witnessed in something like transportation. They have lived from travel by horseback as the dominant form to Mach 2 airplanes and rocket ships. Compare that to what we have seen with electronic technology. The changes in transportation are

trivial when compared to electronics. Moreover the time we have to absorb these changes is growing shorter and shorter. We will have to adjust to future change far more rapidly than our grandparents did.

PROKES: As I was saying a few minutes ago, children growing up at this time experience a "blur" in their daily lives. We have to ask how we can help them to distinguish the real from the unreal because they take so much for granted. I can understand why a "Columbine" can happen. What we are seeing, right

and left, by way of violence and what people are willing to do to one another, comes I believe, in part from the blur between the real and the unreal, from a loss of significance of the body, the significance of an "event" and the consequences that flow from it.

CROSS: I was talking to a young man earlier about the moral implications of virtual reality. I think all reality is virtual. Philosophically that makes me a moderate realist, not a solipsist. I don't think that subjective experience is all there is. Nor am I a skeptic who believes that's there is no possibility of true knowledge. Finally, I am not a naive realist who says everything is the exactly the way it looks. We have a real, but not perfect, capacity to know the real world. As we expand our capacity to be critical of our own awareness and knowledge — that is how we grow towards reality rather than grow towards virtual reality. The idea of technically engineered virtual reality shouldn't be so foreign or frightening to us. It could be an extension of self-knowledge and understanding our own intellectual processes. It has a positive potential. Our greatest gift may be our capacity to know, our ability to know.

I was reminded earlier of a movie, *Forbidden Planet*. Does anyone remember it? Astronauts went to a planet that was full of machines but had no life-forms. It was a totally mechanized planet. The life forms had built the robots in the beginning but then disappeared. Explorers started by destroying the robots but then they themselves began disappearing. Then, they finally understood. Automation had proceeded beyond the point where it was necessary for the indigenous life forms to pull levers to make the machines behave as desired. Everything was automatic through brain waves. Even unconscious thoughts could be read. That led to their destruction. That is a parable that applies to thoughts about virtual reality. It can be and is being misused. And, I agree, it is up to theologians, along with others, to alert us to the good and the bad.

VOICE: We're talking about things in virtual reality: 1) that we do perceive and 2) things that do influence us; so, in a form, they do exist. We can digress but it seems to me from a philosophical perspective that we inflate our ideas and ourselves and miss the single question of what actually sustains that existence, whether it's virtual reality or positive reality. If we break it down either to a molecule, an atom or a sub-atomic particle (and we say that the particle itself exists), we still have the question "why?". What keeps it from dropping into nothingness? What sustains it in the existing state? What keeps it from becoming nothing? This is the age-old question of why is there something instead of nothing? Do we talk

about reality? As you are hinting at, whether it's virtual reality or real reality, it has real implications and real impacts as far as what we perceive and what we do. It's not so much the reality itself that concerns me, but what we gain from these impacts and what we use from those to distinguish it from what we learn as far as real reality is concerned. We could say that the entire human body is this virtual reality complex, the soul being the real part.

This "virtual reality" gives us images and sounds; well, this body is something that gives our souls images and sounds, so that we can come to know each other and God. We are at the very beginning stage; even though virtual reality is the interpretation of sounds, it is still a picture of pictures of pictures. Still, that is all we have to begin with. Regardless of where we're beginning, it is the beginning. To label it as being virtual or non-virtual, real reality, it is *our* reality and it is something that maybe we shouldn't try to particularize as we do, but to universalize so that we become a community, becoming real individuals, not in the sense of being an individual but in the sense of being an individual creation. The important thing is not whether it is virtual or real — but is it? We have to ask the question "why?".

VOICE: I don't fully understand what the theological side is. One thing I seem to notice is that, as technology progresses, not only does the machine get faster but the human being is forced to live more quickly in order to meet the new technology. We have children now who are stressing out now because they can't make the grade of being super-athlete while at the same time attending school. One of the things I want to know is what can be done to prevent the human from destroying himself or herself because he's trying to meet the technology?

PROKES: I'll begin. Once we lose the sense of real relationship, we have really "lost it." We are made in the image and likeness of God. In the early Church the word chosen to describe the inner life of God was *perichoresis*, a word that has a two-foldness about it. Reflect on what Jesus shared: He did not come as a packet of information about who God is. Through His living, through His inviting, praying and speaking about God, but especially through His relating to the Father and the Spirit, He helped us to know that in God the basis of what it means to be a *Person* is ultimately to be in relation. The very existence of God is to be in loving relations, being total self-gift and total receptivity to the gift of the Other.

The danger in the blur that I talked about, is that we lose a sense of real relation. One can do all kinds of

things with something that is only imaginary or very temporarily constructed. It will have an effect, but this effect is only temporary and there is no real relation involved. Immediately, that is to drop out of the most profound aspect of what it means to be a human being — which is to be in relation to God.

Recently, the press and TV were saturated with information about the special "Do You Want to Marry a Millionaire"? I think it is a symptom: people may say "Sure, it was no marriage. Everybody knew there was something 'virtual' going on." But they didn't call it that. One can go away for a few days, come back, and collect the million — and then get an "annulment." The problem is that so much of life is being lived that way; there is a lack of real relation. That would depend upon real body commitment, real body presence, real freedom. The issue is a faith matter, but even more basically, a human matter, because to *be made is to be made in the divine image*. If you miss that, you can "shoot 'em up." If one has seen a shooting spree on an arcade game, one can have the illusion that those shot will reappear tomorrow. I think it is hard to see the whole when one is dealing with a part. *Relation* is absolutely key.

ASHBY: To me the most important word that you used is commitment. Commitment is the core of Christian relationships. Commitment is the core of our relationship with Jesus and it's not virtual. It's personal. It's the part that's so often missing. I'd like to throw in a different idea with regard to virtuality. That's *virtual psychosis*.

If you recall, the idea that was popular through the 60s and 70s that there was something evil about TV. They were just beginning to realize it. TV could present to populations, eg. youngsters, inappropriate images that parents would not necessarily find acceptable. That's extended today to TV's very widely and indiscriminately portraying violence and sexual content that many of us would find offensive. But it concerns not just our children anymore. But you notice we've stopped talking about it? Do you know why — partly at least? I believe that it's partly because we now have more insidious ways of putting those kinds of images in front of our children, in front of ourselves, and we call them *Nintendo*, and *Sego* and video games where we actually let the participant — encourage the participant — to blow things away, to throw out values because it's a fake (exercise).

But it's hard to imagine — much as someone who actually has a schizophrenic or psychotic illness and has difficulty perceiving reality and relationship in terms that others perceive them — it's hard for me to

imagine that does not in some way influence core, if not conscious, values. I know that I sound like a parent who has children who lived and breathed technology for years. But it's true. I can't help but wonder if virtual reality doesn't need some new types of virtual psychology to accompany it. There are new issues that arise when it doesn't necessarily require a mental health professional to deal with questions of values in a dysfunctional environment.

CROSS: In one sense "virtual psychology" is all too on the mark. I think an awful lot of my discipline, psychology, is artificial. It is virtual, rather than real. I am not sure that psychology has not contributed to some of the malaise of our civilization which has very definitely lost its values. Our universities consider themselves to be value-free; scientists think that science has to be value-free. So we have a societal, systemic problem that is due neither to virtual reality nor to the computer. It's much deeper and it's part of a post-Christian mentality. What is the solution?

The solution is to believe in Jesus Christ and not to think that you have to be a part of this civilization. We don't have to make ourselves totally like everyone else, or that our kids have to conform to that civilization. We have to teach them different values; they happen to be more traditional values.

There's another aspect to technological society. My brother-in-law got to be president of the automation company out at the old MacDonnel Douglas, before it was merged with Boeing. I took my students in engineering psychology out there; we went into a building in which every remnant of biological reality except for humans was gone. This was a totally engineered, pristine, steel and glass environment. I found it so oppressive that as soon as I got out I went to Forest Park and spent several hours looking at trees and birds. I still find the technological modern world I met in the Navy and military/industrial establishment like that. I still find that reality very oppressive, distant from God, not-spiritual, not encouraging prayerful contemplation. We need to teach our children about nature because God is more evident in the works of nature — at least to me.

VOICE: I've been working with computers and kids with computers for about 20 years. I've run the gamut from seniors in high school to kindergarteners. Over those 20 years I have seen an erosion of sensitivity to violence, killing, to just plain lack of courtesy. I have seen a lack in people for relationships. I like something you said just a few minutes ago, Dr. Cross. I believe that people — whether that be parents, teachers and so on — have to teach values.

We have to believe in the values; we have to live them; we have to teach them especially to our children. They cannot, until a certain age, distinguish between reality and unreality. It takes a while for them to be able to do that. If they don't get the values before they reach the age of distinguishing them, something happens to them. I'm not calling them "Columbine" material; rather, I'm talking about the pictures they draw, the stories they tell when given the freedom to choose their own subjects. That is what I'm talking about. Sister Timothy, I hope someone hears your call for theologians to help us. But I'm not trying to put the burden on them; we have to share the burden. I believe someone — maybe everyone — has to do it.

PROKES: It's interesting that humor always deals with something that is real. I have been noticing how much of our humor these days deals with virtual reality — whether it is daily cartoons in the paper, or whatever. I recall one cartoon with the tagline "How you can tell when someone doesn't understand what contemporary technology is." A CEO sits at a large desk, addressing his telephone pad: "Oh, how are you this morning, Mr. Button Box?" Humor deals with the incongruities of life, if it is genuine humor. I invite you to be aware of virtual reality as a topic for contemporary humor. Humor can deal with serious reality and simultaneously draw us up short because of incongruity.

NEAR-EARTH ASTEROID RENDEZVOUS Sister Mary Ellen Murphy, RSM

[Sister Mary Ellen Murphy, a Mercy Sister from Maine, has submitted an account of the work she is presently engaged in. Dean of St. Joseph College in Windham, Maine, Sister Mary Ellen, an astrochemist, is on leave from her College to the Goddard Space Flight Center in Greenbelt, Maryland. The editor of the ITEST Bulletin sends thanks to her for her report and wishes her God's blessings on her continuing extraterrestrial interest and work.]

For you what does the word asteroid bring to mind? Extraterrestrial bodies orbiting in space, falling to Earth every now and then and leaving an obvious signature for us to discover? Planetary scientists four years ago sent a spacecraft to an asteroid instead of waiting for the chance that one will arrive here on Earth in their lifetime. NEAR, Near-Earth Asteroid Rendezvous, is a NASA Discovery mission to the asteroid Eros 433 presently 94 million miles from Earth. The now-named NEAR-Shoemaker spacecraft, only about the size of a car, arrived at Eros on February 14, 2000 after traveling for several million miles to reach Eros. You might ask, why go to an asteroid?

Asteroids like meteorites retain much of their primordial composition from the early Solar System unlike the Earth, Moon and Mars whose evolutionary history has modified their original composition as we learned from the Apollo and Viking missions to those bodies. Furthermore, our best telescopes are unable to see the surface features of these relatively minor planets. After orbiting Eros for one year the mission expects to provide the first comprehensive study of the physical geology, chemical composition and geophysics of an asteroid to increase our understanding of the processes and conditions during the formation and early evolution of our planets. The NEAR mission will also characterize the physical and geological properties of an asteroid and infer the elemental and mineralogi-

cal composition. Important also is the clarification of the relationships among asteroids, comets and meteorites. High-resolution imagery will reveal the regolith, the rocky surface layer on a solar system body and the history of impacts as evident in the crater population. Spectroscopic analysis will determine the mineralogical composition of the surface of the asteroid. The presence and strength of any magnetic field and the global density of the asteroid provide additional clues to the history of Eros in the early Solar System.

The five instruments to accomplish these objectives are the following:

- Multispectral Imager to photograph the color and the surface features;
- Near-Red Infrared Spectrometer to map the mineralogy;
- X-Ray/Gamma Ray Spectrometer to identify the chemical elements;
- Laser Rangefinder to measure the topography;
- Magnetometer to search for a magnetic field;
- Radio Science to determine the mass and internal structure of the asteroid.

Asteroids sometimes referred to as minor planets are small bodies orbiting the Sun in what is called the asteroidal belt located between the orbits of Mars and Jupiter.

They number by the best estimate several thousand, the largest of which is Ceres, about 580 miles in diameter and the smallest observed by telescopes are about 30 feet in diameter. Our present knowledge of asteroids comes from remote-sensing, meteorite analyses and photographs taken by Galileo, NEAR and Deep Space I spacecraft. Images taken by spacecraft cameras in some detail are now available for the asteroids Gaspra, Ida, Mathilde and Braille. Asteroids are classified according to their spectra and reflectivity or albedo. About 75% of the known asteroids are C-carbonaceous types like Mathilde, 17 % S-silicaceous like Eros, and less than 10% M-metallic iron with smaller amounts of nickel. The relationship between asteroids and meteorites needs clarification, since the most numerous meteorites are ordinary chondrites, stones that represent, we think, remnants of the larger bodies that were melted so that the metals separated out leaving lighter rocks near the surface of the parent body.

What have we learned after six months from the mission to Eros? This S- or silicate type asteroid was selected to represent the common type asteroids with possibly surface areas of differing chemical composition. Orbiting this big rock in space, 21 miles long and 8 miles in the other two dimensions in the shape of a potato with a butterscotch hue color, presents a definite navigational challenge. Consider that this rock is the width of the Beltway around Washington, DC. Eros orbits around the Sun in 1.76 years turning on its own axis every 5.7 hours. Unlike the Moon and Mars, its non-spherical shape presents a difficult mapping and surface location problem for the instruments on the spacecraft. A large crater near its center 5 miles in diameter and a feature referred to as the saddle are perhaps the most prominent features on Eros. Its surface is heavily cratered with younger craters on top of older ones with ridges and large rock blocks very evident. One prominent ridge is nearly 12 miles long. Such a rock with an average density of 2.7 grams per centimeter similar to crustal rocks on Earth suggests a homogenous body rather than a rubble pile such as on the asteroid Mathilde.

The X-Ray/Gamma Ray instruments on NEAR-Shoemaker spacecraft map the surface in the 0.2-10 MeV region of the spectrum looking for the surface distribution of several geologically important elements: Mg, Al, Si, Ca, S, and Fe, and possibly K, Ti, U and O. Data from the near-infrared spectrometer and the multi-spectral imager will allow direct comparison of the mineralogy results with the elemental composition determined from the x-ray data. The method depends on the Sun for solar flares for the initial x-rays, which result on Eros's surface in fluorescent x-rays that the

instrument measures.

Fortunately the Sun in a solar maximum year has had more sunspots, solar flares and UV rays than at any time since 1989. During the period May-June this year, the X-ray instrument collected data during two M-class solar flares. From our data analysis to determine the elemental ratios of Mg/Si and Fe/Si the elemental composition of the surface of Eros resembles a relatively primitive chondritic composition with the depletion of S and possibly Ca and Al. Elemental abundance ratios depend on solar temperatures, measured by x-ray fluxes determined by the GOES spacecraft which during this time period was looking at the same region of the Sun as NEAR-Shoemaker. Model spectra for several type meteorites and solar temperatures from 2-40 million Kelvin were used to obtain elemental compositions.

Meteorites, stones or metal from our Solar System that have fallen on the Earth, serve as ground truth for these remote-sensing techniques. Meteorites are good representatives from parent bodies that have differentiated into a crust, mantle, and core. To prepare for the data analysis, a large meteorite database was compiled to serve as a reference for the data analysis. About 2000 meteorites with close to 3000 analyses comprise the meteorite database to compare with the elemental composition of the asteroid. We compared the ratios of Mg, Al, S, Ca, and Fe to silicon on Eros with the bulk compositions of known meteorites in our database. From the data received from the spacecraft this summer, we conclude that the area observed on Eros during these particular solar flares resembles primordial chondritic meteorites that have not undergone differentiation, making the surface of Eros most similar to the chondrite meteorites, specifically the sub classes of H, L and LL. Al particularly sensitive to partial melting is depleted in the regions observed during these two flares on Eros making this conclusion feasible. It is still possible that other areas on the asteroid have undergone some heating and partial melting. During the remaining six months orbits over other regions will be observed to determine the chemical composition of the major elements there. The chemical composition of the interior walls and floor of several large craters will also be desirable information regarding the question of a homogenous body for Eros.

During the remaining months of the mission, the spacecraft will gradually descend to lower altitudes where the X-Ray/GammaRay instruments will have priority for data collection. We look forward to the integration of our analytical results with the other science team's conclusions to summarize our new

knowledge about Eros in particular and asteroids in general to increase our understanding of the history and evolution of our Solar System.

In this Jubilee year, the holy doors that opened for me revealed the marvelous beauty and splendor of creation here in our own Solar System and beyond in the ever-discovering universe. The words of Niels Stensen, a 17th century bishop and scientist considered

to be the father of mineralogy seem so poignant for me:

"Pulchra quae videntur,
Pulchriora quae intelliguntur,
Longe pulcherrima quae ingnorantur."

Beautiful are the things seen,
More beautiful are the things understood,
By far the most beautiful are the things not known.

FROM THEOLOGY: METHOD AND CONTENT

Joseph Murphy, S.J.

[We here reprint the article "Theology: Method and Content," published in *Transfiguration: Elements of Science and Christian Faith*, ITEST Faith/Science Press, St. Louis, 1993, pp. 184-212. Fr. Joseph Murphy, S.J. is currently teaching theology and bioethics at the Pontifical College Josephinum in Columbus, Ohio.]

Answer the question "What is theology?" and risk losing a readership at the outset. Theology can seem an already abstract discipline to ordinary people, perhaps irrelevant to the common inquirer. As I was finishing my graduate degree a patient, educated man asked, "What will you do as a theologian?" I couldn't explain why theologians don't exist but theologians do, and I knew that distinguishing physicists from physicians would only lead to trouble. I should have said that a theologian does theology the way a cobbler crafts shoes or a forward plays hockey. People know that shoemaking and hockey are "disciplines" with subsets and specialists from sandal makers to goalies.

Good cobblers and lousy goalies are at least marked by their products. But *theology* often appears unproductive, on the one hand heavily philosophical, or on the other hand exclusively pious. In any event, it is seen to be removed from common discourse. If someone today, for example, says theology is reflection on mystical experience, someone else will call it a theory of religiously-oriented praxis (practice) aimed at social reform, a contradictory explanation which only muddies the waters. In other words theology today suffers a crisis of content or method or both. If only theology were like rap music, we would understand its method at once and appreciate, however reluctantly, its content. The effect of rap is immediate, whereas a theory of rap delays its impact and hinders its artist.

We will, nonetheless, risk a definition of theology to combat current confusions and make it intelligible to the common believer, or at least to those educators responsible for instruction in a living tradition of a holy faith. Theology is not rap, in spite of Mary Daly

books which in the elevated language of *Pure Lust*, *Gyn-ecology*, and now *Outercourse* bewail from her third galaxy the phallocracy that needs "be-dazzling and be-witching" *Beyond God the Father*. Yet theology enjoys a set of data as objective as a column of hockey statistics and a method as sharp as the rules of the ice or the shoe shop. High sticking in hockey games (like adultery in moral theology) is always and everywhere wrong, though dozens of ways of attacking the net are all permissible. Leather, laces, uppers and toes are optional in shoemaking, but soles are non-negotiable.

Of course, a definition removed from a practice is risky. High-school English lessons that ask "What is poetry?" still immunize legions of adolescents against any literary future through an initiation to verse beginning with its reduction to a sleep-inducing prosaic memory byte. Poetry is a doing as much as a thing defined. Definitions, some complain, fragment reality and isolate the observer from the object. In real life, as a bumper sticker might read, process is product and seeing is believing. The discipline and its method, so specialists in "cultural hermeneutics" insist, determine one another. Dogma, creed and doctrine, they say, inextricably depend on the year and place of proclamation so that theology, whatever it is, must change with the times in both object and method. A definition is only for today. Think, they argue, how feminist or black theology were nothing three decades ago. A Blondel or a Scheeben returning to the academy today might imagine that Hispanic liberation theologians are a school of neo-Suarezians.²

Yet such novelties demand clarity instead of a vague

theological method open to endless revision. Pure process produces pure mush. Seeing wrong is believing unto one's own destruction. Not that hermeneutics is useless! Jesus, and Augustine after Him, also preached the coherent interplay between man's world and God. They just had it backwards to contemporary ears. "Believe," they said, "and you will see. First have faith and then you will understand." When St. Anselm, half way between Jesus' day and ours, linked theology to faith, he provided that beautiful definition which has stood the test of time up to now. But if today's faith is weak, as it is, and if theology is in more disarray than in Anselm's day, we must offer a revised definition, not contradictory to his, saving his "What is theology?" from lazy ears that only hear "What is poetry?" and then rush to reduce the art and science of the harmony between God and His creation to an atomized, prosaic empiricism.

A Definition³

Theology, in two words, is *intellectual worship*. This is a much needed pithy rephrasing of what Anselm said nine centuries ago. He had defined theology quite well for beginners and specialists alike as "faith seeking understanding," but in reaction to him or his worldview others have sought, especially since the rise of the natural sciences, for an appealing and comprehensive definition, even a trendier slogan or phrase, to show that theology still gives life. Thus one is told today, not very correctly, that theology is "reflection on religious experience" or "the interpretation of myth," or a "human as opposed to a natural science." Some feel, given the comprehensive revealed subject matter of theology, that it is unavoidably oppressive, at odds with the freedom of thought due the academy. Still others make the objective pieces of written tradition, like the New Testament, a subjective voyage for author and reader alike. Scripture, the heart of theology, they say, is preeminently an exercise in searching for God.

These variations on Anselm and on our own definition reveal the biases and prejudices of our times. On the one hand, the empirical mindset in the natural sciences can demand a rigorous submission to data and an objectivity of method for any discipline worthy of its name. There can be no room for sentiment, pious legend, unexamined doctrine or unanalyzed texts. On the other hand, the "freedom" in the social sciences more obviously or immediately includes the scientist as part of their subject matter. If theology resembles a social science, the theologian is tempted to question, even doubt, what he previously held as the equivalent of empirical data.

The claim that the so-called indifferent observer exists nowhere is meant to trouble the theologian above all others. His or her data, supposedly grounded in miracles and confirmed by "appearances," cry out for justification as much as any physicist's theory of the subatomic universe. To define theology, then, is to become accountable to multiple audiences, some appreciative of faith but uncomfortable in defending it, others skeptical of religion, however respectfully their secularity tolerates it, and others ready to deconstruct the entire canon of Scripture and Tradition. Given such diversity, we will also have to describe, in enriching our two-word description above, several things that theology is not.

First of all, to call theology worship is, besides locating it within faith, to make it an active creation of the theologian focused on a set of data which is more than mere information. Theologians are not dispassionately staring at facts they cannot deny, like astronomers discovering a new galaxy in a telescope; they are affirming the object of faith, the Revelation, the Christ really, as the ground of their reflection. Worship is inescapably all-encompassing. It defines the worshiper, is offered as self-fulfillment and is an act of commitment in response to a calling. Its "objectivity," at least for a Christian, depends not on distance from the object worshiped but from self-acceptance of oneself as already an object, a very creation, of the love of the one worshiped.⁴

Worship is a difficult term, fraught with overtones of the ritualistic, the private, the incommunicable, even the occult. One imagines exclusive ceremonies for the initiate in secluded "churches" outside the rhythm of daily life. We define it here, however, as a free act of self-donation which affirms the order at once of the self and the world in relation to their origin and end. One cannot worship without some minimal form of self-abandonment, some risk before an Other which is either loving or hostile, peace-giving or oppressive. For example, ancient pagan worship, often from fear of the gods, would flee to a comfortable pantheism at the price of denying the worth of one's own creation, explaining it only as an intrinsic loss or fragmentation of ideal being as it fell into the sordid and suspect cosmos of materiality and flesh.

This pagan worship was often necessarily unpleasant or frantic, an exercise either in capturing and controlling the numinous or the hostile deity through the trickery of magic, a manipulation of the holy, or else in elevating the self toward divine union by immersion in the orgiastic mysteries of temple rituals. Because the sexual can encompass the personal so completely, vestal virgins, eunuchs and temple prostitutes served

to demonstrate this self-risk, this element of loss or escape at stake in pacifying the divine. As the myths reveal, ancient worship was frequently insecure, an act of appeasement more than of loving abandon, a resignation rather than an embrace.

A second difficulty with *worship* is the seeming bias of the term. Theologians, one could object, like their counterparts in the natural sciences, cannot preclude their "findings" by interjecting themselves into the work. Truth clouded by subjectivity is potential illusion. Should not all sciences, theology especially, be detached from the commitment implied in worship? This objection suffers first of all from the techniques of an information age in which data alone try to pass for truth. Technology, when it provides growth in information, can make "more" seem better. *In vitro* fertilization, for instance, brings a child to birth under the supposedly optimal circumstances of controlled corrective conception. When genetic manipulation one day provides the choice of a child's features, who can dare object that such a capability is not "better"? What can be will be.

Yet the Catholic Church, for one, does object to this quantification of humanity and this rationalization of human life through its reduction to separable integers or monads. The naked information required to produce a Louise Joy Brown in 1977 or an atomic bomb in 1945 cannot automatically pass for truth. The true, as any student of Scholastic philosophy knows, is interchangeable with the good.

Sterile information needs a living interpretation connecting it to personal truths which lead to actions springing from commitment. The bomb formula, or any scientific "advance," is good only in relation to our final end, the good of the human species in union with God. Even the practical truths of driving a car and baking a cake are neither true nor false apart from the larger contexts of a committed whole. Truth without commitment is helpless information, as dangerous as it is liberating. That theology should include worship-filled commitment makes it no less true, say, than the worship which is marriage. My marriage partner is my very truth as much as my good. The truth of our marriage is always concrete, never exhaustively objectifiable, since this truth comes to me as gift, evocative of my own self-donation. The other person is an object of my worship in the Lord.

Even the seemingly detached empirical truth of the natural sciences faces its observer with wider philosophical choices. Take this century's disputes and discussions in nuclear physics among Heisenberg, Bohr, Planck, Einstein and others about quantum

theory, indeterminacy and the fixity of the primary particles. The universe refuses to submit to the rationalizations of a Grand Universal Theory or to Hawking's Theory of Everything. Recent discoveries in physics testify to the non-manipulability, the freedom, of the subpersonal physical creation.

"Indifferent" observers, however detached from subjective input they may hope to be, always confront an object which is, for Christians, part of a free creation and an irreducible mystery in itself. Physicists must not control the cosmos or even chart it so much as understand it as irreducible gift. The freedom of the creation is the basis both of its intelligibility and its inclusion in a free order of worship which we do not control. We might know with objective certainty that the pretty leaves, mere subpersonal objects, will return in the fall but even they, as beautiful and free, are always new.⁵

If in our day the cosmos, although objective, continues to humble its most brilliant investigators by its mystery, we should not expect to find the higher mystery confronting a worshipping theologian any less objective, less *a priori*, less mysterious or less "scientific." Properly understood, the astronomer too engages in worship. His or her worship is not mythological conjecture, as from a prescientific era, nor again is it the psychic musings of a New Age or enneagrammatic⁶ astrology. Such worship is a commitment to a human truth, a human benefit or good, in correlation with its divine origin.

Astronomers do not passively submit themselves to the so-called "laws of nature" whereby an anthropocentric perspective would shift to a cosmocentric, nature-oriented worship of a world now become materialistic. Otherwise such an observer might be tempted to atheism or pantheism once God is naturally linked to necessity. The same dangers apply to an embryologist inclined to manipulate the world by attempting to fertilize a human gamete with a subhuman one. If the combination should someday yield a living "product," the novelty is not "more" but actually "less" because of its diabolical disordering of a humanity ideally ennobled by the marital covenant but here deprived of the care and inclusion in worship due human-centered reality.

If genuine truth depends on commitment to the human good and if the world is colored by its nearness to God in the order of worship, the theologian needs no apology for his or her starting point. The philosopher, the botanist, the technician — none can escape participation in ultimate purpose. They must finally worship some order of being, in slavery or in

freedom, or else they impose their own world on others. This is not to say that commitment is blind or that affectivity precludes thought. Commitment is objective, but the object of its love or worship can never be rationalized and reduced to a quantum of intellectual curiosity. Worship, one way or the other, becomes either the free or the enslaving structure of the world, a chosen response either to the beauty of mystery or to the trap of necessity.

In describing scientists as worshipers we mean that they labor in the presence of mystery and focus their lives in freedom around a central truth, not that they adore their work or its data with the reverence due only to God. We mean that to neglect the inseparable relation between scientific activity and our ultimate purpose is a distortion of truth. But do scientists by their intellectual activity therefore become theologians? No! By describing physicists as worshipers we only locate them within the Christian mystery and avoid the reductionism resulting from an artificial split between faith and reason or between the world of nature and "spiritual" realities. We intend to liberate their work from mere recitation of necessary laws and submit it to the freedom or risk of hypothesis, thus demonstrating that no scientists will avoid the hidden commitment, the philosophical stance underlying such human endeavor. Such scientists are intellectuals but not theologians, since the formal object researched is not immediately the Revelation as such. But only the Revelation, Christ, and through Him the Triune God, is the final proper object of full worship. It is this Revelation that theologians, inspired by faith and committed to its enactment, explain by their hypotheses.

ENDNOTES

1. Hermeneutics is the study of the methodological principles of interpretation (as of the Bible).
2. Blondel and Scheeben were theologians of 50 to 100 years ago. Suarezianism was a theological school promoted mainly by Jesuits a few centuries ago.
3. In this paper we will pass over the particular characters and movements in the historical development of theology, a task done by others before. Condensing such works here would oversimplify their contribution. Instead we will present our definition in the light of such theological history and with a view to the interdisciplinary nature of this volume. Among the better of those other sources are the following: A reader interested in a formal Catholic definition of theology should consult Karl Rahner, ed., *Sacramentum Mundi. An Encyclopedia of Theology* 6 vols. (New York: Herder and Herder, 1968-70), s.v. "Theology," where Rahner describes theology as a science of faith and then explores its parts and nature, a view compatible with this paper. A condensed but detailed history of movements and people is found in *New Catholic Encyclopedia* 17 vols. (New York: McGraw-Hill, 1967, 1974, 1979), s.v. "Theology, History of," by P. de

Letter. Most recently, Francis Schüssler Fiorenza, "Systematic Theology: Task and Methods," *Systematic Theology: Roman Catholic Perspectives* vol. 1, edited by Francis Schüssler Fiorenza and John P. Galvin (Minneapolis: Fortress Press, 1991) has summarized systematic movements in theology through Augustine to Aquinas and down through the twentieth century. His description of contemporary shifts such as the transcendental turn in theology, hermeneutics, method, and "new" theologies, pluralism, etc., are most informative and provide a good introduction to the current disputes. See also Avery Dulles, *The Craft of Theology*, (New York: Crossroad, 1992) for a brief treatment of theology in relation to philosophy, the physical sciences, the university and the doctrinal tradition. A recent text on the nature of theology and its sources is, Aidan Nichols, *The Shape of Catholic Theology: An Introduction to its Sources, Principles and History* (Collegeville, MN: The Liturgical Press, 1991).

From a non-Catholic perspective, but often in agreement with our thesis, see John Macquarrie, *Principles of Christian Theology*, (New York: Charles Scribners Sons, 1972) and Wolfhart Pannenberg, *Systematic Theology, I* (Grand Rapids, MI: Eerdmans, 1991) translated by Geoffrey Bromiley.

4. Theology as intellectual worship is a definition continuous in the work of Donald J. Keefe and, as far as I know, originating with him. See his *Thomism and the Ontological Theology of Paul Tillich* (Leiden: Brill, 1971) in which the phenomenological (Plato and Augustine) and analytic (Aristotle and Aquinas) methods of philosophico-theological thought are related to the faith as it exists for contemporary Catholic and Protestant (Tillich) theology. His more recent work, *Covenantal Theology: The Eucharistic Order of History*, 2 vols. (Lanham, MD: University Press of America, 1991) provides, as a highly learned and excellent achievement, for a faith grounded on the historical event of the New Covenant and for an ever "hypothetical" theology respective of the freedom in that truth. Distinguishing the truths of faith as free, as mystery, over against the immanent syllogisms and "necessary" truths of a fallen reason or logic, the work presents a theology responsive to Church teaching. The theologian, by free charismatic gift of the Spirit responds to the Christic doctrinal presence of truth grounded in the Eucharist in the same "non-oppressive" way that Christ and the Church are maritally related and originally prefigured in the one-flesh relation between Jesus and His Mother.

5. The dispute among physicists over the "freedom" or indeterminacy of the sub-personal cosmos concerned much of the 1991 convention of the Institute for the Encounter between Science and Theology. See "Seminar with Fr. Stanley Jaki," *Proceedings of ITEST Workshop, October 18-20, 1991*, edited by Robert Brungs and Marianne Postiglione, St. Louis: ITEST Faith/Science Press, 1992. Other topics included Christianity as the matrix of modern science and the freedom of the good creation as the protection against reducing the cosmos to a grand necessitarian theory, to a set of laws or to a comprehensive rationalization.

6. A personality analysis based on the nine types of human personality reportedly developed in the Sufi tradition.

[TO be continued in the next Bulletin. The whole article is in Transfiguration, as noted above.]

NEW MEMBERS

MC ADAMS, Patricia; 102 Gatehouse Drive; Kennett Square, Delaware 19348; U.S.A.; Writer; University of Delaware; Biotechnology/Agriculture; (610)-444-1669; (day)(302)-831-1356; FAX (302)-831-3651; E-MAIL mcadams@udel.edu.

PERKINS, PhD, Peter; Holy Cross College - Math Department; Worcester, Massachusetts 01610; U.S.A.; Professor of Mathematics; Holy Cross College; -Mathematics-theology connections; (508)-793-3375; E-MAIL grandview4@aol.com.

CHANGE OF ADDRESS

VAN HOVE, SJ, Fr. Brian; 7625 N. High St. - Pontifical Coll. Josephinum; Columbus, Ohio 43235; U.S.A.; Priest, Teacher; Pontifical College Josephinum; (701)-271-1295; E-MAIL bvanhove@pcj.edu.

E-MAIL (PHONE) CHANGES

BLASCHKE	E-MAIL	jablaschke@aol.com	
CLINE	E-MAIL	cline007@mc.duke.edu	
COUGHLIN, IHM	E-MAIL	jcou@marian.hcm.com	PHONE: (570)-281-1002
DONAGHY	E-MAIL	john@staparish.net	
FABBRI, SJ	E-MAIL	cef@fcias.org.ar	
GAISS, OP	E-MAIL	bgaiss@gateway.net	
HOEBING	E-MAIL	hoebiph@quincy.edu	
KAMPWERTH, PHJC	E-MAIL	svkampwerth@juno.com	
KEEFE, SJ	E-MAIL	dkeefesj@optonline.net	PHONE: (914)-965-7236
KLAUS, MM	E-MAIL	hklaus@dgsys.com	
KNAPP, SJ	E-MAIL	jknappsj@yahoo.com	PHONE: (314)-533-6637
KOTERSKI, SJ	E-MAIL	koterski@fordham.edu	
LORENTE, SJ	E-MAIL	mlp@pinon.ccu.uniovi.es	
MATSCHINER	E-MAIL	matschiner@mindspring.com	
MOREY, JR.	E-MAIL	rwmorey@swns.net	
PLISHKA	E-MAIL	prokimen@zxmail.com	
RSM's, Providence	E-MAIL	MERCYRI@AOL.COM	
SLOCUM	E-MAIL	bob_slocum@polatomic.com	

IN MEMORIAM

Sister Thomas More Bertels, OSF
 Father Frederick Jelly, OP
 Monsignor Donald Sullivan

We also ask your prayers for ITEST members who are ill. May they feel the restoring hand of the Lord.