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CHRISTIAN PERSPECTIVE ON THE EXPLOSION OF KNOWLEDGE*

MARION A. MILCZEWSKI

Director, University of Washington Libraries, Seattle, Washington

Some months ago when I was asked if I would speak to this group I agreed to do so, even though with some hesititation. The title, "Christian Perspective on the Knowledge Explosion," seemed general enough to allow a good deal of latitude of interpretation and relevant enough to my interests as a librarian. Furthermore, you as an audience were then distant and out of focus, but now here you are - in sharp detail.

I could bounce figures at you for the rest of the morning to prove or to underscore the fact that there really has been an explosion of print. Whether it is an explosion of knowledge you as some of the primary consumers of print are in a better position to judge than I. However, I have been forced to conclude that there has been an explosion of knowledge, but I am not sure that the magnitude of the amount of print and that of knowledge are of the same order. Let me tease you with a few statements and figures about the explosion and refrain from overwhelming you with a flood of them.

There was a time when a single man could claim to be in possess-

*Address given at the Conference on Christianity and Literature held on the Seattle Pacific College campus October 17, 1964.
ion of all human knowledge and be reasonable sure that he would not be challenged.

Perhaps a century ago some men might reasonably claimed to have studied everything in a single science.

The proportion of the total realm of knowledge about which any man can claim to be fully informed continually grows smaller with the passage of time.

Now for some figures: Dr. D. J. de S. Price in his *Science Since Babylon* states, with little fear of contradiction, that the main forms of primary publication in science have been the proceedings of learned societies and journals. By 1800 nearly 100 had been published; by 1850, 1,000; by 1900, 10,000; by 1960, over 100,000; but of this last figure only about 25,000 were thought to be alive. Others have different estimates. Dr. G. Miles Conrad of *Biological Abstracts* estimated that in 1952 there were 50,000 scientific and technical journals in existence throughout the world, but nobody really knows because there are no comprehensive up-to-date lists that one can turn to. Charles Bourne of Stanford Research Institute puts the total figure in science as close to 30,000 journals, but further states that "more realistic estimates seem to point to a worldwide publication of about 15,000 significant journals with one million significant papers per year." Take your choice - but think BIG.

This is just in science and technology.

The Library of Congress attempted to make a systematic census of
world book production in all fields, but it was not kept up. However, the 1954 figures gave the following estimates for annual production:

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It used to be that once books, and especially journals or newspapers, were out of print they were unavailable for later acquisition except first by reprinting and later by photography, but these were expensive means of reproduction. Micro-photography reduced the cost (and also the size of the image and introduced the need for expensive reading machines). Xerography has lowered the cost for a full size copy of a page to ten cents for a custom-made copy and about four to five cents a page for a similar copy where a microfilm is already available as the intermediary. But this relatively low cost has introduced another problem - what I call redundancy of paper. Cheaper methods of reproduction - just over the horizon - will only compound the problems.

Now I would like to quote from a recent article in *International Science and Technology*, written by the distinguished historian of science, Derek J. de Sola Price: "In this paper I shall deal with two types of statistical analysis; that in which an index is observed to vary with time, and that in which variation of an index is examined with some other factor or variable. In the first type one finds that almost any measure of science
shows it to grow exponentially with time; that is to say, at compound interest doubling (for most indices) every 10 - 15 years. Growth is regular, almost unaffected by recessions and wars, and where there exists a long enough time series one may show that growth has been proceeding thus for nearly three hundred years, ever since the middle of the seventeenth century when modern science emerged and the technique of the scientific paper was invented.

Roughly speaking, the numbers of scientists and scientific papers have multiplied by ten for every mere doubling of the population. For three centuries, science has been exploding into our civilization at a rate that makes the much-publicized population explosion look like a pop. Alive now are scientists produced over about 45 years - some three or four doubling periods. For every scientist who had lived before these were born there is another from the first doubling period, two from the second, four from the third, and perhaps eight from the fourth. Much as we miss Copernicus and Newton and Galileo, most of the fellows are still with us, for about 90% of all the scientists that have ever lived are alive now.

Although this point has been quoted frequently since I first computed it, the quoters have often attempted to show by it that modern science is burgeoning extraordinarily. Alas, from the very nature of the derivation it is apparent that this phenomenon of 90% immediacy is built in to the growth of science and has therefore been true from the very beginning. In the days of Maxwell, of Franklin, and perhaps even of Newton it was true that most scientist who had ever been were then alive."
I will not attempt to go into further detail of Dr. Price's argument except to say that in describing the statistical mechanics of exponential and logistic growth he applied them to a variety of different kinds of growth curves and concluded, "We may also assume that even quantities we cannot effectively measure...would be subject to the same sort of distribution if ever we could make an acceptable count." From this I conclude that the same general growth pattern should be discernible in other kinds of publication as in science. While no one has yet, as far as I know, applied these statistical measures to other literatures, in particular to the social sciences or belles lettres for example, I feel confident that we are dealing with relatively the same kind of growth in all areas of publication.

We may see a breakdown of the traditional methods of publishing and of soon going directly from the author's draft to computer and computer allied storage and machine retrieval both of bibliographic entry and text, but the exponential increase in the amount of informals to be handled is certain. There appears to be no end unless a slackening of exponential growth should occur or saturation is approached.

Now what is the "Christian Perspective" included in the subject of this brief presentation? It would be useful for one of our distinguished theologians to give us some insight into this matter. I am forced to provide only a relatively simple view which assumes that nothing special needs to be said about Christian vocation, that this underlying philosophy is understood and accepted.
Let me illustrate by this anecdote: Religion became the topic of conversation in a railroad smoking car after the clerically garbed Episcopalian Bishop George Craig Stewart joined the group of men. "Want to hear my religion, sir?" asked one man. "It's the Golden Rule - simply the Golden Rule." "Want to hear my astronomy, sir?" replied the Bishop. "Twinkle, twinkle, little star - simply twinkle, twinkle."

First let me state two beliefs.

One. There can be no Christian objection to the growth pattern evidenced in the knowledge explosion we are considering. In the first place, the growth we see results from a number of factors, such as a population explosion, an increase in the literate population, an increase in the number of people with higher education, and an increase in the number of people with a "higher" higher education.

In the second place, this pattern of growth has been in force since the creation of man and must, I believe, be considered one of the natural forces at work.

Two. The knowledge, the facts, the truth which are the fall-out products of the explosion are neither Christian nor non-Christian. But man's capacity to reason and the sense of obligation to objective, unprejudiced, factual truth are among his God-given gifts. The Christian scholar knows that he can neither reject scientific or humanistic truth nor agree that they represent all truth. Furthermore, he cannot stand aloof and fail, by standing aloof, to understand the significance of the knowledge that comes to him. He knows he must, with God's help, attempt to under-
stand; and with what insight he gets from the Lord, he must attempt to explain and through this process contribute his force to the explosion. Beyond this stance of the observer is that of participant, scientist, writer, artist, teacher in the search for and the transmission of truth which characterizes all of these.

Rather than objecting to the vast amount of knowledge available to him the Christian should rejoice, for in the main the knowledge explosion is the result of the search for truth wherever that search leads. The universe and the world and all that are in them were created by God and were not meant to be hidden and forbidden, but to be enjoyed and appreciated as God's creations. Not all searchers for truth are Christians, nor are all of them attempting to understand what has been created as God's handiwork. But the end result of the probing, the dissecting, the analyzing, the synthesizing, the comparing, provide the Christian with insights into the nature of God which his faith by itself cannot give him.

The nature of the explosion of knowledge is such that it is more difficult to get the kind of "complete" view of man, his world and the universe that early encyclopedic man had. Let me go back to the numbers game again and illustrate the problem from my viewpoint as a librarian.

The University of Washington is a society of scholars. Scholars are searchers for the truth. To provide this society with the printed materials it needs to feel "reasonably" certain of keeping up with the knowledge explosion, the University spends about $600,000 a year for books, journals, reports and all other kinds of print, near-print and microforms. This
amount brings us something like 20,000 current journals and other serial publications, 70,000 books and perhaps 5,000 microforms to add to the 1 1/3 million volumes we now have. In addition, we receive through agreements with governments and government agencies tons of publications issued by them in all parts of the globe. Furthermore, through the network of arrangements we have with other libraries in the United States and Canada, we have access to millions of additional volumes and almost all of the current journals published in almost any language of any significance. We probably should be spending closer to one million dollars annually for books and journals and adding about 150,000 volumes a year to make sure of receiving all the significant publications issued in the world and of filling in gaps - oceans would be a better word - needed to develop a first-rate collection for all of the subject areas in which the University has a research interest. The problems involved in an effort of that kind are almost beyond reasonable solution. The mass of material already coming in is just barely recordable. The articulation of the recording system with the problems in which researchers are interested in order for them to be able to find the materials they may need becomes more complex; first, because knowledge is more fractionated and more specific (general subject approaches to the mass is no longer productive); and second, because new concepts and new relationships are being constantly introduced. It is difficult enough to handle the volume we now get. I shudder to think what we will have to do - but do it we must - that is, provide six or eight or ten subject entries in our catalogs where we now
include three or four.

But the real burden is on the scholar who must somehow, through whatever aids are available to him in catalogs, indexes, abstracts, computer memories and his God-given resourcefulness, winnow the information that is awaiting his attention. It is no longer possible to be that general person "the scientist," for to keep up one would need to review something like a million scientific articles a year. Instead of understanding the whole he can but understand the fraction, but even in that fraction he should be able to see the handiwork of God.
ON THE RELATIONSHIP OF ART AND THE CHURCH*

or THE LITURGIA OF ART

ERNEST C. SCHWIDDER, M.F.A.

Head, Department of Art, Seattle Pacific College, Seattle, Washington

Relationship of Art and Religion

It is at best unfortunate (and at worst ignorance of history) that some opinions within the church indicate that art must play a minor role in the effective functioning and the realization of the church's ultimate goals. In actuality, the church could not exist (in a human form) without some sort of visual expression. Certainly the church has never been without it, even if at times in dubious ways; and even more certainly no religion has been without its visual symbol. Throughout history art and religion are inseparably joined. The reason is logical although not always obvious. If art is the visual expression of the great ideas of man and religion demands a certain doing or action - such as the teaching of its doctrines and its way of life, then religion cannot exist without expression and art cannot help but express what man is, his beliefs, his way of life.

Throughout the history of the Christian Church architecture, frescoes, mosaics, sculpture, and the minor arts have bent the knee under the yoke of service in the earthly kingdom of Christ our Lord. Imagine, if you will, a magnificent Gothic cathedral without sculptural detail, stained

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glass, carved altar, fine candlesticks, vestments (or a priest before the high altar dressed in a suit of the new continental look), and, if architecture is included as an art form, without the building itself. It cannot be done. Put it another way: without art, religion in time fades into an obscure verbal account of vague doctrines unconfirmed by life and practice.

Relationship of the Church and the Symbol

Every group must have some common element of cohesion if it is to function as such. Although we live in a primarily verbal society, it is still the visual that communicates most rapidly to the greatest number of people. Our society lives by trademarks. The American flag is a national trademark to nearly 180 million people. Individuals of all kinds from a great diversity of national origins salute the Stars and Stripes as a symbol of patriotic unity. Every group that even pretends religion must also have some outward symbol. The Amman group have their costume, the Mormons their temple in Salt Lake City, the Bahai adherents their eclectic dome in Evanston, the Buddhists their statues.

The need for a symbol of identity certainly exists within the Christian Church and even within factions of the religion. This unifying symbol might well be the cross; however, there has been a distinct effort lately to define the Roman Catholic Church with a crucifix, Protestantism in general with a cross, and Judaism with a so-called Star of David. These are the most artificial categories, devised by journalists for obvious reasons; for a cross with or without a corpus
visually means the same thing, and the Star of David is in fact an ancient fertility symbol accepted as representative of creation by Hebrews and Christians alike.

However, the search for identity continues and, despite the Ecumenical Movement, has been carried to the extreme. For example, I have been requested to carve a Presbyterian dove (I was not aware that the Holy Spirit was a Presbyterian) and even a Lutheran Saint Paul. In one church a symbol for the sainted John Wesley was acceptable but one for the Blessed Virgin Mary was considered inappropriate.

A Brief History of Religious Attitudes in Art

The study of art is in fact a study of man's beliefs - his religion. In our own century figures of the Savior were set on Christian altars not in the pose of His atoning sacrifice on the cross, but as a gentleman - knee cocked, limp arms extended and a bland painted stare marking perfect Grecian features. What kind of religious conviction do you think this sculpture suggests? The Blessed Virgin has become a symbol for eternal youth with red lips.

History reveals a more virile expression. The great Stonehenge of England, a temple for sacrifice, is all that is left to posterity of that particular culture. There is only a handful of work of the over 5000 years of recorded history of the ancient Egyptians that is not religious in nature. The mammoth temples and rock-cut tombs and most certainly the pyramids stand as gigantic monuments of an enduring age of faith.
Historians have called Egyptian art one of the "inner-spirit." Interestingly the use of animal motifs to depict the spiritualistic qualities of the god-king, such as in the sphinx, is not unlike the allegories of the Bible. The symbols of the four evangelists are prime examples, based as they are on the vision of Ezekiel and also described in The Revelation of Saint John: "...out of the midst thereof came the likeness of four living creatures...and every one had four wings...as for the likeness of their faces, they four had the face of a man, and the face of a lion...and...the face of an ox...they four also had the face of an eagle."

The Greeks reversed the attitudes of the more spiritualistic Oriental religions and put the emphasis on the outer-spirit - the human form. Perfection of mind and body is a cry that is echoed in marvelous statues of Athena, Apollo, Zeus, and Hermes. Ultimately the figures lost even this slim spiritualistic identification and man became god. The Age of Humanism ran its course during the rise of the Christian Era only to be revived at the later 're-birth' of the Renaissance. The evangelists donned the toga in place of wings and animal forms, and their muscles rippled and beards bristled under the chisels of the masters. Today the city of Athens and the city of the spirit bear an uneasy truce while the adoration of the almighty dollar and materialistic pursuits form a new religion - if this is indeed the stuff in which man believes and by whose rule he lives.

Is There a Christian Art?

Recently there has been a revival of interest in the relationship of
art and Christianity. It has become apparent after more than two hundred years of a rational and reasonable religion that our visual expression has pointed to man rather than God. Some have expounded the theory that any expression is a Christian one of the author is a Christian. Although there is undeniably some truth in this supposition, it in no way relates to the problem of what role art should play in contemporary worship. It is purely an academic question as to whether a particular work of art is Christian or not. Few would debate that certain traditional symbols fit into the category. In fact some advocate that only universally accepted symbols can express corporate religion. What they fail to realize is the historical evolution of some of these symbols and the fact that forms in art can become as obsolete as words in a living language. It is not that ancient forms lack beauty or truth; rather it is to be questioned whether the phoenix is as readily understood as the trademark for Cadillac or Tide. Is it really universal? Must our religion be buried under the soaring arches of a past expression? It is too often true that Christianity in modern times has been stored away in an antique casing to be taken out of the vaults once a week. Church buildings have often become more mausoleums to a dead religion than an expression of a living, growing organism. We need action, not archives.

Liturgical Art

Certainly the question of whether or not Christianity needs a whole new vocabulary could be asked. The religion is not new; and most certainly the word of God is unchangeable and constant. But on the other
hand is not art the expression of man to God - and not God to man?
There is no such thing as a painting done by inspiration of the Holy Spirit. Art is response, and as response must change as time reveals varying political, economic, social, technological and philosophical differences from society to society.

In modern times the artist has built himself up to be some sort of god; he creates. The artist is god and the critic is his priest. Even the word layman is frequently used when referring to someone outside these categories.

Art as a gift from God to man can only contradict the work of the stone carver of Gothic times, perched high on a scaffold, offering his service with the works of his hands. No man saw his efforts - only the Holy One for Whom they were intended. A building committee once raised the question as to why I intended to carve all the way around the altar - "No one will see it back there anyway." They were concerned only with the altar's role in man's worship rather than the attitude of man's worship of God. This might be a fine distinction and yet it is just such a narrow line that separates a hack popular art from a vital visual expression. If man is interested in offering a living response to a living God, he will look for the best his age is able to produce.

(After all, someone had to decide that the then new system of buttressed ribbed vaults was better than the currently popular barrel vaulting - and so Gothic architecture was born.) Art is not intended for man's consumption alone; it therefore does not need to serve his individual prejudices - he does not need to "like" it. Ego satisfaction, if that is the consid-
eration, can come from knowing that the best has been offered to a God that demands the best - rather than from the knowledge that the best was done considering the tastes of the priest or chairman of the building committee.

The Need for the Visual in Our Liturgy

Malreaux has worked with the hypothesis, in his book, *Metamorphosis of the Gods*, that art is religion. His general line of reasoning is based on the fact that historically man's religion is expressed essentially in visual terms. This, of course, is a logical extreme and has appeared in virtually every century of man's existence on earth. When Moses did not return from the mountain and the children of Isreal became impatient, they did not dream up another god to take the place of the Almighty; they built one. God Himself has satisfied man's need for the tangible by appearing in concrete forms - flame, cloud and wind. The Holy Spirit appeared as a real live dove with wings flapping. And what is more real than the human body of our Lord hanging and dying on the cross? Today many of our senses are buried under an avalanche of words, reason and rationalism in our society, our schools and also unfortunately in our churches. Art is a necessary part of our liturgy if for no other reason than the satisfaction of our instinctive desire for the visual and the tangible.

But there is a greater reason. The visual symbol can satisfy the senses of man, but beyond that it has the capacity to make the truth, the holy truth, a little more real. It can give religion a sense of reality,
of presence; it can communicate and symbolize the livingness of Jesus Christ. The Holy Redeemer is not a verbal abstraction; He is alive. He reigns as a continuing palingenesis, a continuation of the Christ event. This is the message that can be pointedly articulated in visual terms, perhaps this is the only way.

Relationship of Art and Theology

The role of art in the liturgy is not controversial among those who are sensitive to the concepts already mentioned. What is controversial is the relationship of art to theology. Modern theologians have said there is no theology of art. Modern philosophers have said there is no theology in art. The bridge in this gap between art and theology cannot be completed without the keystone. Both are right, but what neither apparently appreciates encompasses both art and theology. The keystone is man. For it is man that forms theologies and it is man that develops forms in art. Jesus is not a theologian, He is the object of theology. Jesus is not an artist, He is the objective of a Christian expression in art. The motivation is the same - man strives to know his God. Like the arch, theology and art depend on each other to present the total structure. Theology reveals art and art reveals theology and together they seek to illuminate our faith. They do the same thing but in different ways; they do not overlap but touch at the crucial point of man's worship of God.

Most important is a concerned appreciation of such symbols as the altar, font, and pulpit and particularly their use in public worship.
Although the first obligation of art in the church is to give glory to God, it is also important how this offering is made. In a corporate religion it is necessary for a symbol to reach up but also to reach down - to sing praises to God but so the congregation can hear. A symbol should encourage worship. Included in this function is the divine command to teach. Symbols such as vestments, altar furnishings, sculpture, murals and the like should also serve a pedagogical purpose, for in so doing they give glory to God in a very tangible, corporate manner. This, of course, does not mean to appeal to the lowest common level of understanding, but like all good pedagogy increase knowledge.

The building is of utmost importance in considering the art of the church. To many it is little more than a monument at best, or merely a shelter (with padded pews) at the lowest level of understanding of religious architecture. It is both, but first it is a house of God. This concern should be the primary motivation. As such it is a monument and as such it shelters God's children.

The Modern Dilemma

Today there is a distinct revival of theological thought and with it a renewed concern for visual expression. A certain confusion exists in both areas. The modern artist as well as the modern theologian is faced with a dilemma - the "modern dilemma." The search for a Christian expression appropriate to our time is chaotic and slow - weighed down by a Renaissance-Reformation tradition and its several influences ingrained in the structure of twentieth-century thought patterns.
We have inherited the Renaissance concept of the individual. The corporate idea experiences frustration when it must be drained through the delta of a polygonal society, when a work of art is less important than the personality of the man who made it. It is a giant step from the anonymous masterpieces of medieval times to an age where a painting is known only by its author. We speak of owning Picassos, or Braques or Pollacks rather than appreciating a work for its intrinsic value - particularly as a medium of expression, for the viewer as well as the artist. The modern viewer most often asks only what does it give me, rather than bringing something to it and together offering homage to God. The heritage of naturalism was born of the new scientific age which puts spiritualistic concepts in the impossible position of having fingernails and eyelashes - where the infinite world of the inner-spirit must be contained in a too finite form. Then there is the heritage of modern thought where the doing often replaces the motivation or meaning. We today are also heirs of knowledge, and, being only superficially aware of history, we have tended to bend branches in unnatural positions rather than to transplant twigs in our new environment. Or we merely imitate. The heritage of democracy has also had some undesirable effects by giving too many unqualified voices the say-so; a majority rules by reduction to a common denominator rather than by common aspirations or ultimate concerns. And finally the heritage of the Reformation is also ours. Contrary to the intention of the reformers, thought development and expression are curtailed. Theological trenches have been dug across Europe and both sides have been stuck deep in the mud, afraid to move for fear the position will
be lost. But only an insecure position needs to be so defended. A captive art is a dead art; it must be free to investigate, to form new expressions as part of a continuing response to an ageless gospel - a continuing reformation.

No one has all the answers, as no one knows the mind of God. A defined and confined God can exist only in the mind of man. If God is alive, so must be man's expression to Him and of Him. Like the human body, the body of the church changes its cells - new cells, new people. We change, we grow older, a few gray hairs, a few new wrinkles. But like a vain woman before a mirror, the bride of Christ, the church, looks at these new wrinkles in art and architecture and recoils in fear. It is basically fear of losing past glories that forces a woman to pluck out gray hairs and douse her head in ominously named chemicals. Too often the church fears for her past expression and thereby dilutes her natural role as an avenue of praise to God by her living children. Freedom of expression can only be practiced by mature individuals.

Conclusion

Rather than being a limitation, perhaps the modern dilemma presents a greater possibility for a Christian expression than in any other age. The variety of modern thought today allows greater freedom of the individual to express himself. It is the basic corporate idea and motivation that will bind together an ever-changing, searching, artistic expression.
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