



BULLETIN

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The present U.S. presidential campaign, I think, is sending an interesting message. So far, environmental issues have not been pursued in depth by the candidates. A few have mentioned it in passing, bowing now and then to the environmental constituency. But it's not a serious issue yet.

Most attention is being paid either to economic quick-fixes or to the so-called character issues. I ask myself from time to time whether character issues are not primarily the result of relying on 15 or 30 second television ads. Since it is not possible to convey much of importance in 30 seconds, the voter is essentially being asked to trust in the integrity and good sense of the candidate. When all that is being peddled is *sincerity*, and since *sincerity* is easy to fake, questions of character are inevitable. It may not be that simple and clean, but I suspect it's an aspect of today's U. S. politics.

But let's get back to the environment. The economy is currently perceived to be our number one national problem, and jobs are at stake. At least at present, these are perceived by the politicians to be more important than social issues and the environment. A good bit of the popular concern for the environment, it seems to me, has been generated by overstatement and fear-mongering. This is not to say that there are no serious environmental issues to be faced. There are such serious issues. All too frequently, however, these have been publicized in a *the-sky-has-already-fallen* manner. The promoters would defend themselves, I think, by saying they have to get people mobilized. I agree, people must be informed that there are serious problems, but exaggeration is counterproductive in the long run. It becomes propaganda in the worst sense of the word. Long term action, it seems to me, must be built on truth, especially when it means cutting back on consumption. Lent is a good time for Christians to ponder this situation. We need penance; we need repentance; we need God.

Most, we need the Spirit of the Resurrected Christ. It is my prayer that the Risen Lord will hold you close to himself and give you that stunning joy that the disciples felt as they ran back from Emmaus to Jerusalem to announce that the Lord is risen and we have seen him.

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ANNOUNCEMENTS

1. Plans for our 25th anniversary celebration/convention are progressing well. We have received more than enough positive responses to our call for attendance at the Mount Holyoke Center in Massachusetts to confirm our dates for the first week of August (1-6), 1993. If you have not sent in your response, please let us hear from you soon. We can accommodate 100-150 people (including families) at the center. In the last issue we noted that the Board agreed that the general theme of the convention would be beauty. We've often considered truth and goodness; this will be our first extensive consideration of beauty. Also, we would like to make this a celebration for the whole membership and their families. Remember, spouses and children are welcome!

2. As we noted in the second membership renewal letter, the Board of Directors decided in a special meeting in November, 1991, to change the topic for the October 23-25, 1992 workshop from *Is Technology Out of Control?* to *The Human Genome Project*. The latter topic, it was decided, was more timely and important. At present, we have two scientists to press the case for the human genome project, two scientists who urge great caution, a theologian, and a computer scientist who will discuss how the data can be handled. Full details will be sent to you as soon as possible. This workshop will be held at Fordyce House in St. Louis, Missouri.

3. The staff is busy editing the Proceedings of our October, 1991 *Seminar with Fr. Stanley Jaki, OSB*. These Proceedings will probably be available late in the summer. In the meantime, *The Vineyard: Scientists in the Church*, written by Dr. Eva-Maria Amrhein and Fr. Robert Brungs, S.J., will be sent to dues-paid members of ITEST as soon as it is printed — probably by the middle or end of April. Its topic is the role of scientists in the mission of the church. Its cost for non-members will be \$9.95 — U.S. dollars.

4. We'd like to let the membership know that about a dozen ITEST members have accepted the challenge to write chapters for a book on Faith and Science Issues (title open to suggestions) that

we intend to complete in time for the Holyoke Convention. It will include chapters on the methods employed in the various sciences, philosophy and theology. It will also contain some historical material on the growth of science and on the theology/science conflict and two chapters (one written by a Protestant, one by a Catholic) on the elements of the Christian faith. There is still a certain amount of flexibility in this project. We shall keep you informed of our progress. We wish to thank the authors both for their willingness to write these chapters and for sharing their wisdom with us.

NOTICES OF OTHER MEETINGS:

1. There will be an International Conference on Science and Belief, August 11-15, 1992 at the Pascal Centre, Redeemer College, Ancaster, ON Canada L9G 3N6. This five-day conference is planned for scholars with a professional interest in the relationship between science and belief. The first half of the conference will focus on general metaphysical beliefs while the second half will emphasize Christian beliefs. For information call: (416)-648-2131, Ext. 207 or fax: (416) 648-2134.

2. The St. Petersburg Higher School of Religions and Philosophy invites applications for their first International Art Summer School: "Icons and Medieval Art Treasures from the Collections of the Hermitage, Russian Museum and Cathedrals of St. Petersburg." The dates: June 8-18, 1992. Applications to attend the Summer School are invited from people with a professional or serious interest in this topic. Send applications to The Higher School of Religions and Philosophy Seminar, Universitetskaya, 5, 199034 St. Petersburg, USSR.

3. Dr. Bob Greenley [(314)-822-8040], a retired polymer chemist, is available to present a workshop (45-90 minutes) entitled *Is Creativity Compatible with Science?*. It is comprised of four sections: a common sense approach to scientific and medical reports; techniques that may enhance creativity; fostering creativity; serendipity in discovery. If you're interested, call him at the above number.

FATHER PAVEL FLORENSKY AND MODERN SOVIET MATHEMATICS

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INTRODUCTION

P.A. Florensky (1882-1937), a priest in the Russian Orthodox Church, is one of the premier Russian intellectuals of the twentieth century. As a student in the Department of Mathematics of Moscow University from 1900 to 1904 he had a decisive impact on the development of the Moscow school of mathematics. This impact was effected primarily through his close friendship with Nikolai Luzin, the founder of this school, with whom he retained a lifelong friendship.

This paper relies heavily on the research of the Russian historian of mathematics, S. S. Demidov, the one who rediscovered the role of Florensky in modern mathematics after knowledge of it had been lost to the mathematical community.

FLORENSKY'S EARLY YEARS

Pavel Aleksandrovich Florensky was born 9 January, 1882 in Yevlakh, Azerbaijan, the son of a Russian father, an engineer, and an Armenian mother. He had a completely non-religious upbringing. "Religion and everything associated with it was looked upon as something improper." The young Florensky reacted violently to the notion of God as a limit on humanity. He had a "Promethian" (sic) self-image and was "consumed" with a "fierce love" of nature. It became an ecstatic experience for him to view the forms of nature, forms which he saw as mathematical.

While attending a *gymnasium* in Tiflis, Georgia, where he displayed an exceptional talent for mathematics, Florensky underwent a spiritual crisis in the summer of 1899. "The limitations of physical knowledge were revealed to me" and "from that very crisis came my interest in religion." His love of science, however, did not abate. On the contrary, Florensky developed a program to investigate what he now viewed as the integral unity of all phenomena, both natural and spiritual. Thus when he entered the Mathematics Department of the

Physics-Mathematics Faculty of Moscow University in 1900, he came with a clearly defined program of study, in which mathematics had a most important place. In a letter to his mother on 4 October, 1900 he wrote:

I now study mathematics, . . . and a little philosophy. . . . with mathematics I am absorbed more and more. Everywhere are found correlations, analogies and parallels. This, which I have wanted to learn from mathematics since the second grade, I now little by little begin to get, and am entirely sure that I will get more. . . Mathematics for me is a key to that world view in which there is . . . nothing that is not worth being connected with the rest. . . . Natural philosophy is connected in integral unity with ethics and esthetics. Religion gets an entirely new sense and finds a proper place in this unity, a place of which it had earlier been deprived [by the renaissance], after which it had found it necessary to build a separate isolated place for itself.

Florensky had a specific interest in the mathematics of discontinuous functions already in the *gymnasium*. He wrote to his father on 7 September, 1900, just after his arrival in Moscow:

I am already more and more convinced that the 'axiom' of continuity is a very one sided hypothesis, which in many cases can not stand up to criticism. The dualism of body and spirit and a mass of other difficulties could be settled by the acceptance of a completely mathematical, numerical world-view and the use of the science of *discontinuous functions*.

BUGAYEV AND IDEALISM

With this outlook, Florensky could not have chosen a better department in which to enroll. There was then a certain competition between the

universities at Moscow and Petersburg. The latter was more respected, being in the capital, where the Academy of Science was located. Philosophically, the University at Petersburg was center of positivism. Moscow, on the other hand, had become stronghold of idealism, especially the religious idealism of Vladimir Solovyev (1853-1900).

One of the main exponents of this idealism was N. V. Bugayev (1837-1903), a member of the mathematics faculty, one of the founders of the Moscow Mathematical Society, and an associate member of the Russian Academy of Sciences. Bugayev was as much interested in philosophy as in mathematics. His colleague, the philosopher L. M. Lopatin, wrote of him: "In the inner makeup of his mind and the deepest aspirations of his soul he was as much a philosopher as a mathematician." Bugayev was part of a group at the university that founded the Moscow Psychological Society in 1885, and he played an active role in it.

Bugayev was familiar with the works of Kant, Hegel, Locke and Leibnitz. Taking as a starting point Leibnitz's monadology, he created a system which he called "evolutionary monadology." He hoped to make it a universal system able to explain all phenomena. Mathematics entered his system mainly as the theory of functions, which, for Bugayev has two branches: the theory of continuous functions and of discontinuous functions, the latter theory he called arithmology.

Bugayev explained his perspective in an address at the International Congress of Mathematicians, held in Zurich in 1896. The prevailing view among scientists and philosophers, said Bugayev, was based on the assumptions that functions were analytical. They assumed "that all events in the world are subject to certain analytical laws . . . and that if we knew these laws we would be able to predict all phenomena as we do solar eclipses and the movement of planets. . . . Such a standpoint leads to complete determinism." Bugayev argued that many phenomena in the natural sciences, sociology and psychology could not be explained this way. To investigate these one needs the discontinuous functions of arithmology.

The French school of analysis was just then beginning research on discontinuous functions based on the set theory that had been introduced in the

1870s. They soon laid the foundations of the theory of functions of a real variable. Bugayev failed to grasp the significance of set theory, even though as originally presented by Georg Cantor it had a strong philosophical and even theological flavor. In fact this feature led to its rejection by the Petersburg mathematicians with their positivist leanings. In Moscow, on the other hand, a philosophical climate conducive to the acceptance of set theory had been created, thanks largely to Bugayev.

FLORENSKY AT MOSCOW UNIVERSITY

Fortuitously, Bugayev was giving the course of lectures on mathematical analysis in the fall of 1900 when Florensky arrived at Moscow University. He wrote to his father on 25 October, 1900:

It pleases me that my thoughts correspond to the thoughts of our Bugayev; he is always lecturing (of course not in so sharp a form that it could be noticed by everybody) on his special article [here Florensky gave a reference to the paper Bugayev presented in Zurich] pressing the point that mathematics consists of two equal parts, analysis and arithmology, that continuity does not begin to exhaust the possibilities, that the latter is only a special case of discontinuity, that, at last, the many brilliant successes of analysis have gone to the heads of mathematicians and they have gotten carried away.

That same fall the first course of lectures on the new theory of functions of a real variable were given at Moscow University. The lecturer was M. K. Mlodzeyevsky, who was associated with Bugayev and, like him, was active in the Moscow Psychological Society. The course of lectures was repeated in the fall of 1902 and 1904 and again in the spring of 1907. In 1907 a book entitled *Transfinite Numbers* was published by I. I. Zhgalkin, for which the author was awarded a Master's degree at Moscow University the following year.

Florensky attended Mlodzeyevsky's lectures in the fall of 1902. Thanks to his careful notes it is possible to reconstruct these lectures. It is clear that Mlodzeyevsky related Bugayev's ideas on arithmology to the new theory of functions, and even included a partial classification of Bugayev's discontinuous functions.

Florensky used these notes as a basis for his own dissertation, which was titled *The idea of discontinuity as an element of a worldview*. He worked on quite independently on this theme for the rest of his time at the University, reading a vast literature in mathematics, the physical sciences and philosophy. There is no evidence that he had close personal contact with Bugayev, who died the next year (1903). In December, 1902 he wrote to his parents that the work "looks like a dragon: the more I narrow the topic, the larger the number of minute details and the more it threatens to expand."

Florensky submitted the first half for his dissertation under the title *Singularities of algebraic curves*. In it Bugayev's study of discontinuity is related to Cantor's set theory and to the latest work of the French school of the theory of functions of a real variable. In the second, unfinished, volume Florensky proposed to discuss in detail Cantor's set theory and the theory of functions. His notes for this second volume, some dated as early as January 1901, contain many excerpts from the works of Cantor, Peano, and E. Borel. The first part was awarded the highest mark on 31 March, 1904, and was followed by an invitation to pursue graduate studies at the University.

In 1904 Florensky's treatise *On symbols of the infinite* appeared, the first comprehensive account of Cantor's set theory published in Russian. As in his dissertation, he again connected the set theory of Cantor with the theory of functions of a real variable. The same emphasis was found in his treatise *On types of growth*, published in 1906.

By then, however, Florensky was no longer studying mathematics. Having declined the offer to continue graduate studies at Moscow University, he had enrolled in the Moscow Theological Academy and was studying for the priesthood. The 1906 paper was in fact published in the journal of the Academy, *Theological Herald*. In fact the 1904 treatise on set theory had been published in the short-lived journal of the Religious-Philosophical Society of Writers and Symbolists, in which Florensky had earlier published two theological treatises.

FLORENSKY AND LUZIN

Florensky made another important and lasting contribution to Moscow mathematics. In the fall of

1902 he organized a student mathematical circle of the Moscow Mathematical Society. From the outset this student circle played an important role in the development of the Moscow school of mathematics and continued to do so for many years after Florensky's departure. Florensky was the secretary - and the 'soul' - of the organization. At the meetings of the circle, which were attended by some of the faculty, reports were delivered on set theory and the theory of functions of a real variable.

Among the members of the student circle, Florensky singled out N. N. Luzin, who had entered the University one year after him. Florensky made Luzin his deputy and upon leaving the University bequeathed to Luzin the position of secretary. They maintained a lifelong friendship, and corresponded for the next 18 years.

As the correspondence reveals, Florensky had an enormous influence on Luzin. Luzin discussed his mathematical work in set theory and function theory with Florensky. Florensky had roused Luzin's initial interest in these subjects but Luzin's research in them was probably nurtured by Dmitrii Egorov, who joined the faculty in 1903, after the death of Bugayev. Egorov had studied in Moscow under Bugayev and had traveled to France and Germany, where he studied with the French school of the theory of functions. Luzin made similar travels after graduation, and became Egorov's first, and most important student. Out of their collaboration grew the Moscow school of mathematics.

Despite his interest in mathematics, Florensky never published a paper that the mathematical community would consider original research in mathematics. In a letter to his wife written in the summer of 1908 after three years of post-graduate studies, Luzin discussed his reaction to Florensky mathematics: "But when he showed me his works in mathematics - again old feelings came back to me, the opinion: all his works have no value in the area of mathematics. Vague hints, beautiful comparisons - something very interesting and promising, provoking, attracting, but without results. His capabilities show here, but as yet no results." In fact, Florensky was simply not interested in producing results that would interest mathematicians, but rather in using the results of mathematics in his philosophical and theological writings.

FLORENSKY AFTER MATHEMATICS

Florensky and Luzin kept in contact as they pursued their separate careers. Each went through emotional and spiritual crises until, in 1911-2, both decided on their respective vocations in life. Florensky wanted to become a monk, but his ecclesiastical superior, recognizing his enormous intellectual talent, steered him toward an academic career. In 1911, shortly after getting married, he was ordained a priest, and assigned to continue teaching at the Moscow Theological Academy. The following year Luzin published his first paper, on analytic sets. In 1914 both completed their first major treatises. Luzin received the doctorate for his treatise, on trigonometric series. Florensky published his monumental thesis *The pillar and Foundation of Truth*. They discussed their respective works in their correspondence. Luzin, and Egorov, both read Florensky's treatise and thought highly of it.

In the dedication to his thesis, Florensky explains:

Here an attempt is made to apply a number of mathematical concepts and operations ... to general questions of world view and to problems of spiritual life, and to use the very spirit of mathematics for philosophical purposes, ... this book features the first - for Russian literature at least - application of the algorithms of symbolic logic to philosophy.

From 1911 to 1917 Florensky was editor of the journal of the Moscow Theological Academy. He urged Luzin to publish in the journal, and also N. E. Zhukovsky, the aerodynamics pioneer and then head of the Moscow Mathematical Society.

After the revolution the Moscow Theological Academy was closed. However, the Academy continued to function informally and Florensky continued to teach there until 1924. In 1918 during the first wave of anti-religious destruction, Florensky maneuvered skillfully to preserve the famous Saint Sergey monastery near the Academy. This earned him his first denunciation - for trying to set up an 'Orthodox Vatican.' From 1921-1924 he taught perspective drawing at a state university, and was denounced for setting up 'an idealistic coalition.'

Florensky was one of the speakers in a series of debates between religious believers and atheists that were organized in the first years after the revolution. They drew huge crowds and, though stacked with party activists, often ended in applause for the religious speakers. This led to their discontinuation by the regime.

In 1922, he published a book *The imaginary in geometry* in which he presented an argument based on the theory of relativity for the finiteness of the universe and used this to justify the view of the universe given in Dante's *Inferno*. In it Florensky tried to develop techniques to visualize phenomena like relativity theory and quantum mechanics. He had a strong dislike for abstract laws of physics that could not be visualized.

By 1925 Florensky was working in a state laboratory. The future physicist I. Ye. Tamm worked in Florensky's lab as a young engineer and had the opportunity to study him. He thought that Florensky had the intellectual power to have discovered quantum theory, but that his intellectual perspective prevented him from doing so, except in the realm of electricity, where Tamm believed that Florensky probably had discovered the electrical version of it independently.

In 1927 Florensky was appointed editor of the first edition of the *Soviet Technical Encyclopedia* to which he contributed over 100 articles. The article on dielectrics, for example, two and one half pages long, was coauthored with the famous physicist A. F. Ioffe. Florensky had published a book on dielectrics in 1924 and made many contributions to Soviet science. In the second edition of the Encyclopedia, all references to his name were removed.

In the summer of 1928 he was banished to Nizhny Novgorod (Gorky), but allowed to return three months later after intervention on his behalf. Photographs of the time show that he still continued to attend meetings of various scientific committees dressed in the priestly cassock and apparently even wearing a pectoral cross. His last published work before his arrest was *Physics in the service of mathematics* which appeared at the end of 1932. In it Florensky argued that the entire structure of mathematical knowledge rests upon physical intuition.

This occasioned an attack of Florensky by the leading Stalinist in the circle of Moscow mathematics, Ernst Kolman. Entitled *Against the newest revelations of bourgeois befuddlement*, it appeared in the militant communist journal, *Bolshevik*, at the end of 1933. In the overheated style characteristic of Kolman, all sorts of charges were thrown at Florensky. He began by conjuring up the fate of Galileo facing the Inquisition in order, incredibly enough, to compare Florensky with the Inquisition! He had read much of Florensky's published works and listed a series of offending articles going all the way back to *On symbols of the infinite*. His accusations against Florensky range from "gloomy mysticism" to the promoting of "the interventions of German fascism."

FLORENSKY'S CONFESSION

By the time Kolman penned his diatribe, Florensky was already arrested. An order for his arrest was signed on 25 February 1933 on charges of "counterrevolutionary propaganda and organizing counterrevolutionary activities." He was tried by a three person tribunal in 26 July 1933 and sentenced to ten years of hard labor.

In 1990 the KGB file on Florensky was opened. It revealed the details of the proceedings against him and his attempts to defend himself under interrogation, even while signing confessions. For example, in a statement to his interrogators he told how his first arrest had occurred in 1906 for protesting against the execution of one of the leaders of the 1905 revolution. The chief editor of the *Soviet Technical Encyclopedia*, prominent revolutionary, L. K. Martens, made a courageous attempt to help Florensky. He addressed a letter to the OGPU pointing out Florensky's valuable contributions to Soviet science. It was ignored.

The file reveals that Florensky signed a confession that he was a leader in a National-Fascist organization called "The Party of the Rebirth of Russia," the goal of which was the military occupation of Russia by the Germans. The 'plot' involved a German Jesuit, an agent of the Pope, who was to conclude a union between the Roman Catholic Church and the Russian Orthodox Church. Florensky, a priest, was supposedly the spiritual head of this fictitious 'Party'.

Another prisoner had been induced to invent this complicated 'plot' and Florensky was, apparently under torture, forced to corroborate it. This 'Party' was supposedly formed from the body of the professorate, and its leaders were P. A. Florensky, N. N. Luzin and S. A. Chaplygin. Chaplygin was professor of mathematics, an expert in applied mathematics, and a friend of Luzin and Egorov. (Egorov had been arrested in 1930 and had died in exile in 1931.) In writing his 'confession', Florensky effectively nullified in some parts what he had confessed in others, and tried to control what he 'confessed'. However he was forced to draw a diagram of the leadership of the 'Party'

During the interrogation of Florensky, the materials on Luzin and Chaplygin were set aside, presumably for later use. When Luzin was later denounced on the front pages of Pravda in July 1936 the attack ended a month later without his arrest. Chaplygin was a friend of Luzin and, first informed of the attack on Luzin by their mutual friend, V. I. Vernadsky, wrote a letter to Luzin expressing his personal support. That Luzin was never arrested, and Chaplygin never publicly attacked, are indicative of the unpredictable nature of these purges.

CORRESPONDENCE FROM THE CAMPS

Florensky wrote many letters from the camps. On 12 February, 1934, upon hearing of the death of the symbolist poet Andrei Belyi, Bugayev's son, he wrote: "the reminiscences of our younger days when I knew him well and when his talents were in bloom, are as alive if it were only some weeks ago. . . . one more thread connecting me with the years of my youth is broken."

Florensky continued his scientific work in the camps. In Siberia he worked on permafrost and in the spring of 1934 he completed two major manuscripts which were sent to the Academy of Sciences for its permafrost congress. This was pioneering work on permafrost, and the nature of ice, which was later used as a guide to construction in areas with permafrost, but Florensky did not get credit for the work.

By January 1935 Florensky had been transferred to the camp at Solovky, formerly a monastery, where he organized apparatus for the collection of iodine from salt water. On 24 January 1935 he wrote to

his children expressing his sorrow that, because he had devoted his life to disinterested work on behalf of society, he now had nothing to give them in exchange for their deprivations. Upon hearing the news that his library had been taken away by the OGPU [KGB] he wrote in the spring of 1934:

My whole life has been devoted to scientific and philosophical work, so much so that I have never allowed myself rest, recreation or pleasure. To this service to mankind I gave not only all my time and all my strength, but also most of my modest earnings, which I spent on the purchase of books, photographs, correspondence, etc. . . . But now the labor of my life has been lost . . . [it is] a heavy blow to me . . . the destruction of the results of my life's work is a far more cruel punishment to me than physical death.

After this he began more clearly to pass something of his legacy on to his children. His son, Kirill, was working in the laboratory of V. I. Vernadsky. He wrote long letters to Kirill explaining his scientific perspective. He also carried on a correspondence with Vernadsky about the curvature of space. (Vernadsky later corresponded on this topic at length with Luzin.)

In 1937 Florensky saw the destruction of the huge makeshift arrangement for the production of agar, which he had organized, just as had happened earlier with the production of iodine. He learned that the credit for his research into seaweed and permafrost had gone to others.

So everything is taken away from me at which I worked, in which I attained results and in preparation for which I expended great effort.

He then undertook to list the various fields in which he had worked, as a legacy for his family. In his last letter, dated 4 June, 1937, he wrote,

Everything abandoned me (everything and everybody) . . . above all I think about you, but with worry. Life is dead and at the present time we, more than ever, feel ourselves isolated from the mainland [Solovky is on an island]. It is June and there is no sign of summer, it is more like November.

In a letter to his son Kirill dated 21 February, 1937 Florensky summed up his life's work.

What have I been doing all my life? I have been studying the world as a single whole, as a coherent picture and reality, but at every moment, or rather at every stage of my life I looked at it from a definite angle. I examined its correlations in a cross-section of the world made in a definite direction and on a definite plane, and I tried to understand the structure of the world in this, currently predominant aspect. The planes of the cross-section changed, but one did not cancel out another; on the contrary, one enriched the other. Hence - the continuous dialectical quality of thinking (the change of planes of observation), with an unchanging perception of the world as an integral whole.

THE END

On 25 November a special triumvirate of the UNKVD [KGB] at the Leningrad district sentenced Florensky to be executed. Florensky was apparently transported to Leningrad where the sentence was carried out on 8 December, 1937.

For a month and a half until the end of November, A. G. Favorsky was in contact with Florensky. He told the grandchildren:

Your grandfather Florensky at Solovky was the most respected person - a genius, uncomplaining, courageous, a philosopher, mathematician and theologian. These were my impressions about Florensky, yes, and the impression of all the prisoners who had been with him - he had a highly spiritual and kind attitude toward people, a richness of soul. Everything that ennobles a person.

The sister of V. P. Pavlovsky told about her brother's religious conversion in the camp. Before his imprisonment, she explained, he was "more an atheist than a believer."

His spiritual turning point occurred in the camp under the influence of Father Pavel Florensky, who directed many people to the path of truth. Their first meeting took place

in the prison cell where V. P. Pavlovsky, tired and worn out, had arrived after a long journey. Father Pavel Florensky invited him to eat, since he always had in store biscuits and pieces of bread, which he gave out to help his neighbor. P. A. Florensky worked as a hospital attendant. He gave moral support and spiritual education to many. Everybody respected him, including the non-political prisoners.

THE AFTERMATH

Not only was Florensky himself eliminated, but his memory was erased. It became dangerous to have been associated with Florensky, or to have been involved with the religious-philosophical renaissance in the years just preceding the revolution. Indeed

his friendship with Florensky was one of the accusations hurled at Luzin in attacks by Kolman in the 1930s. Those who had known Florensky were afraid to talk about him, while those who came later had never heard about him.

In his memoirs, written in the 1960s, L. A. Lyusternik, says of Zhegalkin's 1907 book: "This was, obviously, the first account of set theory in Russian." Lyusternik was involved in the attacks on Egorov and Luzin and probably knew of Florensky, if only from the attacks on Luzin linking him with Florensky. Similarly, he refers to the origins of the student circle of the Moscow Mathematical Society as 'lost in the mists of the antiquity'.

It is gratifying that the story of this remarkable person has been recovered and can now be told.

Creation and the History of Science by Christopher Kaiser, Grand Rapids: William B. Eerdmans Publishing Company, 1991, pp. vii, 316. ISBN 0-8028-0197-8. Reviewed by Robert Brungs, SJ, Director: ITEST.

As I am sure you're aware, the most immediate evangelical task facing Christian women and men in science is the clearing away of the debris of several centuries of conflict between theology and science. This present volume should be a great help in carrying out that task.

In it, Kaiser looks at the history of the *Creationist Theory* from Intertestamental Judaism up to 20th century physics. Creationist theory, as Kaiser treats it, is not connected with today's scientific creationism. Rather, it is concerned with the comprehensibility of the world, the unity of heaven and earth, the relative autonomy of nature and the ministry of healing and restoration. Using this as the basic understanding of the creationist theory, Kaiser shows briefly how the tradition developed, how it was gradually distorted and finally came in conflict with the burgeoning 'modern science' in the late Middle Ages, the Renaissance and, finally, the Enlightenment.

One could pick endlessly at this material, saying one era is unrepresented and another over-repre-

sented, but finally that is a matter of personal judgment. Mercifully, in my opinion, much more attention is given to Newton than to Galileo. I do, however, think a fuller treatment of Voltaire and the Encyclopedists might have been in place. Nonetheless, what is most important is the sweep of the theology/science interaction which Kaiser presents very well. I found it a very worthwhile volume in helping me reorganize my own memory of the this very important Christian concern. Time had somewhat dimmed my recollection of some of the actors and some of the events.

One of this volume's virtues is that it is not written for experts in the theology/science interaction. Since it is essentially a survey, it is written for the 99.5% of us who are not experts in the history of this interaction. It was fascinating reading for me since it allowed me to see almost in a glance the perils that lurk in a too easy and too automatic connection between theology and scientific discovery and, even more, scientific theory. I recommend it highly to my ITEST colleagues.

BIBLIOGRAPHIC NOTES ON THEOLOGY AND TECHNOLOGY

Ninth in a series. Contributions welcome.

Please send books, articles or notes themselves to
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Austin, Richard Cartwright. *Environmental Theology*. Book 1: *Baptized into Wilderness: A Christian Perspective on John Muir*. Atlanta: John Knox Press, 1987. Pp. 103. Book 2: *Beauty of the Lord: Awakening the Senses*. Atlanta: John Knox Press, 1988. Pp. xi, 225. Book 3: *Hope for the Land: Nature in the Bible*. Atlanta: John Knox Press, 1988. Pp. ix, 262. Book 4: *Reclaiming America: Restoring Nature to Culture*. Abington, VA: Creekside Press, 1990. Pp. 243. (John Knox Press having moved to Louisville, KY, and having failed adequately to handle the books 1-3, all four books are now available through Creekside Press, P.O. Box 331, Abington, VA 24210.) To date, the most comprehensive environmental theology yet written. Can be read separately. "Book 1, *Baptized into Wilderness* . . . , invites Christians to deeper . . . relationships with nature and illustrates principle themes of the series through the life and reflection of John Muir, America's first advocate of wilderness protection. Book 2, *Beauty of the Lord* . . . , is . . . to help Christians dissolve impediments to expressive interactions with life on this earth. Through a dialogue with Jonathan Edwards, founding philosopher of the American evangelical tradition, it concludes that experience of beauty may knit us to God and to the natural world as well" (Book 3, p. 237). Books 1 and 2 provide historical and theological background. Book 1 interprets Muir as anonymous Christian; Book 2 provides a serious spiritual reading of Edwards as anonymous environmentalist. Books 3 and 4 then turn to the Bible and personal ethics. Book 3 is a challenging, original exegesis of the place of nature in the scriptural revelation. "Because the Scriptures express moral relationships among God, humanity, and the full range of life and life-support on this planet, they can help inform our faith and guide our conduct amid the modern environmental crisis. Hebrews developed a complex understanding of the relationships among species sharing the same habitat — a moral perspective, not a technical theory — which I call *biblical ecology*. Liberation is my opening theme. God began work of salvation by rescuing from oppression and sin those who

would come to know and serve the Lord; and the biblical liberation includes not just oppressed people but also oppressed lands. The words *covenant* and *promise* apply to the range of created life as well as to human beings" (Book 3, pp. 4-5). Reflection on liberation is followed by exegesis toward our creativity, sabbath ecology, the fall, and ecological visions in both the Hebrew and Greek scriptures. Book 4 brings the *Environmental Theology* series "to the point of acting . . . Here strategies are formulated to embrace nature within American culture, to protect our distinctive landscapes, to curb America's huge appetite for earth's resources, and to reduce our impact upon the biosphere. The volume also proposes reform within Christian Churches so that our worship and witness may become relevant to the environmental crises that threatens all God's creation" (Book 4, pp. 1-2). Each volume includes narrative "Suggestions for Reading," Notes, Index, and Biblical Citations. Volume 4 has as well an "Index to Series Themes" (pp. 239-243) that complements the "Series Relationships" analysis for Volume 3, pp. 237-239.

Bakke, Ray. *The Urban Christian*. Downers Grove, IL: InterVarsity Press, 1987. Pp. 200. Develops a pastoral theology for effective urban missionaries today. Topics range from "Building Decision-Making Muscle" to "Networking the World." Optimistic about adapting the ways of the world.

Basney, Lionel. "Ecology and the Scriptural Concept of the Master," *Christian Scholar's Review* 3, no. 1 (September 1973), pp. 49-50. Brief critique of the Lynn White thesis. "Man's 'mastery' in the world is therefore ambivalent, qualified both by divine limit and by the ethical implications of God's work of salvation. The Incarnation teaches that Christ, 'Master' . . . was at the same time the 'servant' of all" (p. 49).

Birch, Charles. "How Brave a New World?" *Ecumenical Review* 37, no. 1 (January 1985), pp. 152-160. "Despite appearances we are not in the grasp

of a technological determinism that closes our options forever" (p. 152). Birch outlines the features of a science and technology for a sustainable, global society in which (1) an ecological model replaces a mechanistic model, (2) the value of persons is included in risk/benefit analyses, (3) richness of experience becomes equal in value to consumption of goods, (4) science becomes democratic instead of elitist, (5) science and technology will serve global instead of national and local goals, and (6) technology will become non-violent.

Birch, Charles. "The Scientific-Environmental Crisis; Where Do the Churches Stand?" *Ecumenical Review* 40, no. 2 (April 1988), pp. 185-193. "The ambiguity of the effects of science and technology has two sources. On the one hand as knowledge grows arithmetically our ignorance grows geometrically Secondly, the ambiguity of science and technology is tied to . . . the mechanistic model of science As a methodology mechanistic science has been highly successful. But as a metaphysics of nature it has had disastrous consequences" (pp. 189-190).

Birtel, Frank T., ed. *Religion, Science, and Public Policy*. New York: Crossroad, 1987. Pp. xiii, 152. Eight essays from three series of lectures at Tulane University. Contents: A.R. Peacocke's "Rethinking Religious Faith in a World of Science" and "The Disguised Friend — Biological Evolution and Belief in God," Langdon Gilkey's "Is Religious Faith Possible in an Age of Science?" Stephen Toulmin's "Religion and the Idea of Nature," Richard S. Westfall's "Newton and Christianity," Karl E. Peters' "Toward a Physics, Metaphysics, and Theology of Creation: A Trinitarian View," Philip Hefner's "Sociobiology and Ethics," and John T. Noonan Jr.'s "The Bishops and the Ruling Class: The Moral Formation of Public Policy." Most articles deal with religion-science relation. Only Hefner's and Noonan's consider public and church policy, respectively. Peacocke's and Hefner's essays have been published elsewhere. Gilkey repeats *Religious and Scientific Future* (1970). Peters summarizes the editorial interests of *Zygon*. Only Westfall and Toulmin break new ground. Poorly and unevenly edited.

Boys, Mary C. "Religious Education in the Age of New Communication Technologies," *Media Development* 32, no. 2 (1985), pp. 29-32. Religious

education can use new telecommunication technologies, but to do so requires critical and imaginative appropriation if the Gospel is really going to be communicated.

Chandler, David H. "Energy: Toward More Ethical Alternatives," *Christian Scholar's Review* 11, no. 2 (December 1982), pp. 112-123. Theological defense of ecology followed by a section on detailed practical steps Christians should adopt such as earth sheltering, passive solar design, etc.

Christians, Clifford G. "A Cultural View of Mass Communications: Some Explorations for Christians," *Christian Scholar's Review* 7, no. 1 (September 1977), pp. 3-22. "Given the ferment within contemporary media research, . . . the Christian community cannot simply imbibe the 'received view' uncritically" (p. 9). "Communications theory desperately needs a prophetic voice" (p. 22). Proposes what is called "a cultural approach" animated by the Calvinist theology of the cultural mandate to meet this need. Contemporary communications research is based on the idea of humanity as "a bundle of biological drives and physical senses" (p. 16), whereas "culturalism recognizes that communicative bonds are moral bonds" (p. 15).

"Church Statements on Communication," *Media Development* 31, no. 1 (1984), pp. 1-36. Includes statements by the Swiss churches, the World Council of Churches, by a group of bishops and others from Brazil, by the Church of Finland, by Lutherans, communications persons from Latin America and the Caribbean, by Asian Catholic bishops, by Latin American bishops, and by Bishop George Moser of Rottenburg and Stuttgart, President of the Communication Commission of the German Catholic Bishops' Conference. Following are Larry Jorgenson's "Church Statements on Communication: Their Place in a Process," John Bluck's "Ecumenical Debate on Communication: A New Beginning," and Virginia Stem Owens' "Was Christ the 'Perfect Communicator'?"

"The Church and the Computer." *Review and Expositor* 87, no. 2 (Spring 1990), pp. 181-299. Contents: "Editorial Introduction," Richard L. Gorsuch's "Computers: The Old/New Problem of Dominion," Glen H. Stassen's "A Computer-Ethical Call to Continuous Conversion," David T.

Britt's "Computers and the Southern Baptist Convention," and J. Ralph Hardee's "Computers and Local Congregations." There are also three appendices by Hardee on "Church Administration Software," "Church Computing Resources," and a "Glossary."

Dietrich, Jeff. "Discerning This Fateful Hour," *Catholic Agitator* 20, no. 5 (June 1990), pp. 1-2. This is the first of three articles by Dietrich considering the implications of Ellul's thought for the Catholic Worker movement. Each article is supplemented by reprints from Ellul and others. See also: "Jacques Ellul and the Catholic Worker of the Next Century: Therefore Choose Life," *Catholic Agitator* 20, no. 6 (July 1990), pp. 1-2; and "The New Nazi Eugenics — Bio-Technology Engineering," *Catholic Agitator* 20, no. 7 (August 1990), pp. 1-2. The original article is reprinted, along with an interview with Dietrich, in *Catholic Worker* 57, no. 6 (September 1990), pp. 1 and 4.

Dreyer, Elizabeth. "Toward a Spirituality of Work," *New Theology Review* 2, no. 2 (May 1988), pp. 53-65. Impressionistic reflection on work in relation to experience of community, as opportunity for practicing the presence of God and the dark nights, as means to self-knowledge. Considers also the possibility of a specifically Christian "way" at work. Argues the need to be honest about the many dimensions and ambiguities of work.

Eldson, Ron. "A Still-bent World: Some Reflections on Current Environmental Issues," *Science and Christian Belief* 1, no. 2 (October 1989), pp. 99-121. Issues in environmental management pose threats to the continued well-being of humanity and creation. On the basis of the many secular and Christian publications in recent years, reflection suggests a number of special questions for a biblical theology of creation, fall, and redemption. Such questions focus the character of scientific processes, the prediction of the future, and the problems of risk analysis. This approach offers the opportunity for Christians to engage in dialogue with others involved in decision making at a time when governments are increasingly sensitive to public concern over environmental problems.

"The Environment: Caring for God's Creation." *Lutheran Theological Seminary Bulletin* 69, no. 3 (Summer 1989), pp. 1-57. Contents: Roy J.

Enquist's "In This Issue" (pp. 2-3), Clay E. Peters' "Blueprint for the Environment" (pp. 4-9), I. Garth Youngberg's "Agriculture and the Environment: New Directions in the Search for Sustainability" (pp. 10-14), Peggy H. Knight's "The Task of the Environmental Protection Agency" (pp. 15-20), Paul F. Bente Jr.'s "An Environmentalist's Assessment of the EPA" (pp. 21-26), Karen L. Bloomquist's "Creation, Domination and the Environment" (pp. 27-31), "Panel: The Responsibility of Business for the Environment" (which includes W. J. Hindman's "A Prescient Entrepreneur Reflects," Ernest S. Rosenberg's "Moral Responsibility for Environmental Protection," and James A. Nash's "Six Criteria for Environmental Responsibility," pp. 32-36, 37-44, and 45-48, respectively), Paul F. Bente Jr.'s "Becoming a Responsible Entity in God's Creation" (pp. 49-56), and Paul F. Bente Jr.'s "A Sample Letter" (p. 57).

Ferré, Frederick. "Technology and Religion," chapter 7 in *Philosophy of Technology* (Englewood Cliffs, NJ: Prentice Hall, 1988), pp. 97-116. Good brief review of mythic images of technology, arguments for and against on the dependency of modern technology on Judeo-Christian theology, and some views of relations between non-Western religions and technology.

Fore, William F. *Television and Religion: The Shaping of Faith, Values, and Culture*. Minneapolis: Augsburg, 1987. Pp. 219. Television has replaced the church as cultivator of contemporary culture. A diagnosis and etiology plus realistic strategies for the church to serve in a society where the TV dominates. Creative and subversive strategies emerge from the Niebuhrian models of "Christ transforming culture" and "Christ and culture in paradox."

Freedman, Benjamin. "Leviticus and DNA: A Very Old Look at a Very New Problem," *Journal of Religious Ethics* 8, no. 1 (Spring 1980), pp. 105-113. An examination of "Thou shalt not let thy cattle gender with diverse kind; thou shalt not sow thy field with two kinds of seed" (Leviticus 19:19). After a survey of classical commentaries, concludes that the traditional Jewish prohibition against hybridization is limited and does not apply to DNA engineering, but admits there are other possible interpretations.

Girard, René. *Things Hidden Since the Foundation of the World*. Stanford, CA: Stanford University Press, 1987. Pp. 469. Within an exhaustive overview of Girard's theories of the victimage mechanism and mimetic desire, the relation of science, Christianity, and violent apocalypse is discussed on pp. 253-262. Christianity's demythologization of sacrificial ritual mechanisms has revealed the human origin of violence. However, nuclear warfare now replaces the ancient sacrificial system. "In a world that is continually losing its sacred character, only the permanent threat of immediate and total destruction can prevent men from destroying one another. Once again, violence prevents violence from breaking out" (p. 255). Nuclear warfare even takes its names from the "direct divinities in Greek mythology, like Titan, Poseidon, and Saturn, the god who devoured his own children. We who sacrifice fabulous resources to fatten the most inhuman form of violence . . . how can we have the extraordinary hypocrisy to pretend that we do not understand all those people who did such things long before us: those, for example, who made it their practice to throw a single child, or two at the most, into the furnace of a certain Moloch in order to ensure the safety of the others?" (p. 256).

Gosling, David. "Towards a Credible Ecumenical Theology of Nature," *Ecumenical Review* 38, no. 3 (July 1986), pp. 322-331. Notes emphasizing the importance of the "integrity of nature."

Greenberger, Robert S. "What's Up in Israel? Elevators, Thanks to a Special Institute," *Wall Street Journal* (December 3, 1990), pp. A1 and A11. Brief story on the work of engineer-theologians who use science and technology to solve problems of Halachic observance.

Gregorios, Paulos. "Science and Faith," *Ecumenical Review* 37, no. 1 (January 1985), pp. 140-151. Discussions of absolute causality and the existence of a world independent from our consciousness. The author argues that there "will have to be some repentance expressed on behalf of science, in relation to some of its arrogant exclusivism and tall claims in the past" (p. 149).

Hollinger, Dennis. "Can Bioethics Be Evangelical?" *Journal of Religious Ethics* 17, no. 2 (Fall 1989), pp. 161-179. Yes, but only if it modifies "its past biblicalism and ethical rigorism" (p. 177). (Article

should be subtitled: How to use bioethics to preach the good news of science and technology to evangelicals.)

Link, Christian. "La Crise écologique et l'éthique théologique," *Revue d'Histoire et de Philosophie Religieuses* 61, no. 2 (April-June 1981), pp. 147-160. Translated from German by Elisabeth Geiger. Condensed English version: "Ecological Ethics and Christian Ethics," *Theology Digest* 31, no. 2 (Summer 1984), pp. 149-153. Relying on the insights of others, Link argues that Christians must see themselves as part of the problem.

Lyon, David. "Modes of Production and Information: Does Computer Technology Challenge Marxist Analysis?" *Christian Scholar's Review* 18, no. 3 (March 1989), pp. 238-245. Modes of information have replaced modes of production as the central medium of domination today. Illustrates this historical shift with Foucault's concept of "panoptic surveillance." Foucault's thought is a crucial challenge to Christian social analysis in the 1990s.

Morris, Colin. "Love at a Distance — The Spiritual Challenge of Religious Broadcasting," *Media Development* 33, no. 4 (1986), pp. 40-41. "The act of broadcasting, however well-intentional and sincerely executed, tears apart the unity of word and action personified in and by Jesus" (p. 40).

"New Technology and Pastoral Challenges." *New Theology Review* 2, no. 4 (November 1989), pp. 3-74. Contents: Robert J. Schreiter CPPS's "Editorial — New Technology and Pastoral Challenges" (pp. 3-4), Paul Lakeland's "Technology and Critical Theory: The Case of Technology" (pp. 5-19), Richard A. McCormick SJ's "Technology and Morality: The Example of Medicine" (pp. 20-34), Regis A. Duffy OFM's "Only the Dance? Ritual in A Technologized World" (pp. 35-47), Robert P. Waznak SS's "Preaching the Gospel in an Age of Technology" (pp. 48-60), David F. O'Connor ST's "Discretion and Capacity for Marriage: Some Canonical and Pastoral Reflections" (pp. 61-74), Joel Rippinger OSB's "Local Theologies in a World Church: The Indigena as Anawim" (pp. 75-78), Roland J. Faley TOR's "Signs of the Times: Capturing Moonbeams, Holding the Vision" (pp. 79-86), Joseph V. Kiernan OFM's "On My Mind: Reconciliation — The Sacrament in Search of a

Constituency" (pp. 87-88).

Noore, Susan. "Religious Television Destroys the Sacred," *Media Development* 34, no. 2 (1987), pp. 31-33. "The decision to decline active involvement with the electronic media" can be an exercise of responsibility for the church.

O'Donovan, Joan E. *George Grant and the Twilight of Justice*. Toronto: University of Toronto Press, 1984. Pp. ix, 196. Comprehensive review of Grant's thought on politics, theology, and technology. Originally a doctoral dissertation. Reviewed by James Skillen in *Christian Scholar's Review* 15, no. 4 (June 1986), pp. 403-405.

Reichenbach, Bruce R. "C.S. Lewis on the Desolation of De-Valued Science," *Christian Scholar's Review* 11, no. 2 (December 1982), pp. 99-111. Examination of Lewis' philosophical objections to naturalism in *Miracles* (1947) and his fictional critique of science in *That Hideous Strength* (1946). Lewis' primary concern is the temptation of science to "reach beyond the experimental to provide a metaphysical account of the universe" (p. 104).

Rolston, Holmes III. *Science and Religion: A Critical Survey*. New York: Random House, 1987. Pp. x, 358. First-rate textbook alternative to Ian Barbour's *Issues in Science and Religion* (1966). Rolston's survey of the dialogue between religion and science contains a sustained criticism of the process theology assimilation of God to the natural world. Reviewed by S. Mark Heim in *Christian Scholar's Review* 17, no. 4 (June 1988), pp. 490-491.

Russell, Robert John, William R. Stoeger SJ, and George V. Coyne SJ, eds. *John Paul II on Science and Religion: Reflections on the New View from Rome*. Vatican City and Notre Dame, IN: Vatican Observatory Publications and University of Notre Dame Press, 1990. Pp. xxvi, 122. John Paul II's message to a Vatican conference on the 300th anniversary of Newton's *Principia*, and commentaries by 19 scholars, only a few of whom address the issue of technology (see, e.g., the contributions by John B. Cobb Jr., Lindon Eaves, George F. R. Ellis, Elizabeth A. Johnson, Carl Mitcham, Tullio Regge, and Rosemary Radford Reuther).

"Science and Religion." *Anglican Theological Review*

63, no. 4 (October 1981), pp. 367-513. Special issue, guest edited by Ruth Tiffany Barnhouse, containing Huston Smith's "Science and Theology: The Unstable Détente," William G. Pollard's "Science and Transcendence," David J. Rose's "Energy and Attitudes," E. Mansell Pattison's "The Behavioral Sciences in a Christian Perspective," James A. Hall's "Psychiatry and Religion: A Review and a Projection of Future Needs," Edward L. Alpen's "The Biotechnology Race," Richard K. Toner's "Thermodynamics and Theology," David A. Ames' "Science and Religion: Toward Understanding and Collaborating in the University Setting," Philip Morrison's "Warfare Today: Limits to Growth," Allan M Parrent's "Review Article: Faith, Science and the Future: What Happens When Science and Religion Actually Meet," and "A Selected Bibliography of Books in English Concerning Science and Religion" by David K. Himrod and Richard S. Brooks. The bibliography contains a section on "Technology and Religious Values."

Smith, David H. "Bioethics: Recent Literature," *Anglican Theological Review* 64, no. 1 (January 1982), pp. 85-89. Brief review highlighting Joseph Fletcher, Tom Beauchamp, Stanley Hauervas, Richard McCormick, and Paul Ramsey.

Soukup, Paul A. "Interweaving Theology and Communication," *Media Development* 32, no. 1 (1985), pp. 30-33. To analyze the relations between communication and theology it is necessary to distinguish fundamental, systematic, and pastoral theology in relation to various aspects of church, culture, and communication.

Staudenmaier, John M., SJ. *Advent for Capitalists: Grief, Joy, and Gender in Contemporary Society*. Regina, Saskatchewan, Canada: Campion College, University of Regina, 1988. Pp. 26. Pamphlet publication of a lecture from 1987.

Staudenmaier, John M., SJ. "Liturgy in a Technological Age," in Peter E. Fink SJ, ed., *The New Dictionary of Sacramental Worship* (Collegeville, MN: Liturgical Press, 1990), pp. 762-768. Pre-Vatican II balance of universal Latin literagies and popular devotions based in local communities has been broken. Technological transportation and communication undermines local community, consumerist advertizing weakens universal symbols. Considers how the church might "retrieve the basis

for a community rooted in sacred symbols in a culture whose technological infrastructure fragments community even as its best funded form of public discourse, advertising, demeans the symbols themselves" (p. 766). Cults and TV entertainments are false responses to real needs. Hope for more authentic responses can be found in reviving Catholic traditions of theater, spiritual direction, and narrative theology.

Staudenmaier, John M., SJ. "Restoring the Lost Art: Storytelling, Electronic Media and Fragmented Public Discourse," *The Way* 28, no. 4 (October 1988), pp. 313-322. "The vitality and depth of our public and personal lives requires [narrative. But] nearly two centuries of western history have led to an electronic style of public discourse that fragments the ancient bonds of speaker and hearer . . ." (p. 320).

"Technology and Religion." *Research in Philosophy and Technology*, vol. 9 (1990). Pp. xv, 376. Theme section contents: William B. Jones and A. Warren Matthews' "Toward a Taxonomy of Technology and Religion" (pp. 3-23), A. Arnold Wettstein's "Ultimate Weapons in a Penultimate Age: A Theological Assessment of SDI Technology" (pp. 25-41), David Novak's "Technology and Its Ultimate Threat: A Jewish Meditation" (pp. 43-70), Waldo Beach's "The Impact of the Electronic Media on American Religion" (pp. 71-79), Robert C. Good's "Religion and Technology: A Look at Television Evangelists and Viewers" (pp. 81-91), J. Mark Thomas' "Are Science and Technology Quasi-Religions?" (pp. 93-102), Frank R. Harrison's "The Judeo-Christian Tradition and Crises in Contemporary Technology" (pp. 103-118), Larry Rasmussen's "Mindset and Moral Vision" (pp. 119-128), Charles Mabee's "The Fragility of Time: Orwell and Ellul in the Matrix of Theological Origins" (129-148), Darrell J. Fasching's "The Dialectic of Apocalypse and Utopia in the Theological Ethics of Jacques Ellul" (pp. 149-165), Gabriel Vahanian's "Artificial Intelligence and Western Culture: A Christian Approach" (pp. 167-183), Robert Cummings Neville, "Technology and The Richness of the World" (pp. 185-204), David E. Schrader's "Technology: Our Contemporary Snake" (pp. 205-215) and Martin H. Krieger's "Temptations of Design: A Meditation on Practice" (pp. 217-230). Colloquium section contents: Jane Mary Trau's "Humanae Vitae and the Current

Instruction on the Origins of Human Life" (pp. 233-242), John F. Post's "On Reenchanted the World" (pp. 243-279), Frederick Ferré's "Technology, Nature, and Miracle" (pp. 281-286), John F. Post's "A Reply to Ferré, and a Comment on Trau" (pp. 287-290), Jane Mary Trau's "God-Talk, Physicalism, and Technology: A Mutual Endeavor" (pp. 291-295), Michael J. Carella's "The Myths of Thomas Szasz" (pp. 299-313), and Albert Borgmann's "Communities of Celebration: Technology and Public Life" (pp. 315-345). Review section contents: Reviews of C. Mitcham and J. Grote, eds., *Theology and Technology: Essays in Christian Analysis and Exegesis* (1984) by Friedrich Rapp, David A. Hoekema, and James F. Salmon, with a response by Carl Mitcham and Jim Grote; of F. Ferré, *Philosophy of Technology* (1988) by Thomas Rogers, Charles Dyke, and Steven Lee with a reply by Ferré; and of A.L. and R.P. Hiskes, *Science, Technology, and Policy Decisions* (1986) by David C. Snyder.

Verhey, Allen. "The Morality of Genetic Engineering," *Christian Scholar's Review* 14, no. 2 (December 1985), pp. 124-139. Critique of utilitarian theories applied to genetic engineering (e.g. Joseph Fletcher) in favor of a more traditional approach (e.g. C.S. Lewis). "The biological revolution requires wise people, not just clever people" (p. 124).

Waters, Brent, and Verlyn L. Barker, eds. *Science, Technology and the Christian Faith: An Account of Some Pilgrims in Search of Progress*. Charlotte, NC: United Ministries in Higher Education, 1991. Pp. vii, 145. Final Report of a United Ministries in Education/United Ministries in Higher Education Exploratory Committee on Science, Technology and the Christian Faith (1983-1990). Part One is the Report (pp. 3-39). Part Two, "The Redlands consultation Papers: 1985," includes Rustum Roy's "STS: A New Opportunity for the Re-Integration of Christian Concern into American Academic Life" (pp. 43-53), James B. Miller's "Foundations and Challenges" (pp. 54-63), Ronald Cole-Turner's "Theological Engagement with Science and Technology" (pp. 64-68), Brent Waters' "An Ethical Framework for Campus Ministry in a Scientific and Technological Age" (pp. 69-76), Scott I. Paradise's "A Ministry to Scientists and Engineers" (pp. 77-84). Part Three, "The Duke Consultation Papers: 1987," includes Edith Sylla's "The Modern Problem" (pp. 87-90), Patrick H. McDonalds' "Two

Hands, Two Feet, One Hand, One Heart" (pp. 91-101). Part Four, "The Jacksonville Beach Consultation Papers: 1989," includes Ansley Coe Throckmorton's "Bible Study: Psalm 24" (pp. 105-108), Langdon Gilkey's "The Influence of Science on Theology" (pp. 109-116), Roger L. Shinn's "Technology, Theology and Human Decisions" (pp. 117-125), Verlyn L. Barker's "Science, Technology and the Church" (pp. 126-131), Ansley Coe Throckmorton's "Bible Study: Mark 6:30" (pp. 132-135). Part Five contains three documentation appendices on participants and chronology.

Wilkinson, Loren E. "A Christian Ecology of Death: Biblical Imagery and 'The Ecological Crisis,'" *Christian Scholar's Review* 5, no. 4 (June 1976), pp. 319-338. Struggles with the relationship between theodicy and the bloody exchange of death for life inherent in the ecology of the food chain. Even in Eden, life is sustained only at the expense of other life. Vegetarianism does not alter this inescapable fact. Wilkinson concludes: "It may not be that the Fall brought death into the world, but that at the Fall, death became an enemy" (p. 324). Death may not be totally the result of sin. Develops a theology of substitution relating the Eucha-

rist meal of Christ to the principle of exchange inherent in the food chain. Quotes Bertholt Brecht: "The slogan of Heaven: Eat and be eaten" (p. 334).

Wilkinson, Loren. "Cosmic Christology and the Christian's Role in Creation," *Christian Scholar's Review* 11, no. 1 (September 1981), pp. 18-40. The Christian church has largely failed to develop fully the implications of Christ's Incarnation for an understanding of the divine immanence.

Wybrow, Cameron. "The Old Testament and the Conquest of Nature: A Fresh Examination," *Epworth Review* 17, no. 1 (January 1990), pp. 77-88. Makes three arguments against the view that Christianity is a cause of the modern technological mastery of nature: "(1) 'Nature' in the Old Testament, though not sacred or divine, is not therefore inanimate or merely a shock of resources; (2) The Genesis account of dominion does not give man the entire world, but only a part of it, and only a partial control over that; (3) The technological enterprise, insofar as it goes beyond the acquisition of ordinary arts and crafts, is viewed by the Old Testament with suspicion" (p. 80).

The reliance of rational inquiry upon *historical* rather than ideal criteria is relatively novel in intellectual history; it is only in the Western world, in the cultures formed by the Judaeo-Christian religious tradition, that the experimental sciences have flourished by reason of that recourse to experimental verification of understanding. Fr. Jaki has written a great deal stressing the significance of the massive ten-volume study written by Pierre Duhem early in this century. The latter five volumes of this work, whose publication were delayed by an atheistic French academic establishment for nearly forty years, point out the anticipation of the first law of motion, which underlies all of experimental physics, by John Buridan, a fourteenth century scholar who taught for perhaps fifty years at the University of Paris. A nominalist who identified intellect and will, his name is better known from its association with a dilemma foisted on him by his adversaries, and known to philosophy as that of Buridan's Ass; you may recall that it finds an indecisive donkey starving to death between two equally attractive stacks of hay. But Buridan was better than that; his excogitation in the late Middle Ages of the notion of "impetus"

had been forgotten for centuries when Duhem's magnificent historical scholarship recovered it. Buridan had been driven to the derivation of this novel idea by the Judaeo-Christian postulate of a created universe whose diverse motions were also contingent and consequently had beginnings in time, instead of being inherent in materiality as such as Aristotelianism had supposed. Buridan's inference of a temporal beginning from the fact of the creation of the physical world placed him in this respect within the Augustinian camp, whose view of creation had been developed earlier by St. Bonaventure in the course of a controversy with St. Thomas. St. Thomas had defended the rational possibility of the creation of what amounts to an Aristotelian universe, one without a temporal beginning, in which motion is interpreted as an dynamism or *appetitus* necessarily intrinsic to material substance insofar as light or heavy. St. Thomas therefore denied that the contingency of creation required a beginning, and thus that it implied the particularity and contingency of motion and so of time. (*An excerpt from the paper of Fr. Donald Keefe, S.J. presented at the October, 1991 ITEST Workshop, A Seminar with Fr. Stanley Jaki,*)

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IN MEMORIAM:

We recommend to your prayers our deceased members, Father James Meara, S.J. of St. Louis and Dr. Eric Seal of Balwyn, Australia. We also recommend several of our members who are seriously ill and greatly need God's help and consolation.

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