Biography

RALPH WENDELL BURHOE: HIS LIFE AND HIS THOUGHT

V. The Struggle to Establish the Vision as a New Paradigm

by David R. Breed

Abstract. This fifth and final installment from the author's book-length study of Ralph Wendell Burhoe's life and thought covers the period 1966–1987, and it concludes with a summary of his thought. *Zygon: Journal of Religion and Science* began publication in March 1966, the same year in which the Center for Advanced Study in Theology and the Sciences (CASTS) was founded. Both the journal and the center were made possible by Meadville/Lombard Theological School. After a brief period of flourishing, CASTS was succeeded in 1972 by the Center for Advanced Study in Religion and Science (CASIRAS). Burhoe married Calla Butler in 1969, two years after his first wife, Frances, had died. He retired from Meadville in 1974. The Templeton Prize for Progress in Religion was awarded to Burhoe in 1980. His thought is summarized under the topics of values, thermodynamics, the evolution of religion, the concept of soul, God, enculturation and freedom, and the Lord of History.

Keywords: Calla Burhoe; Frances Burhoe; Burhoe's thought; CASIRAS; CASTS; IRAS; Meadville; Templeton Prize; *Zygon*.

This installment completes the discussion of the development of Burhoe's vision for revitalizing religion in the light of the sciences. I have already discussed the events leading to Burhoe's acceptance of the chairmanship of a new interdisciplinary Committee on

David R. Breed, an independent scholar and systems consultant, lives at 5218 South Dorchester Avenue, Chicago, Illinois 60615. This article is excerpted from his 1988 Th.D. dissertation at the Lutheran School of Theology at Chicago, "Toward a Credible Faith in an Age of Science: The Life and Work of Ralph Wendell Burhoe."

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Theology and the Frontiers of Learning at Meadville. The committee had the responsibility for developing the theology and science component of the New Design for Theological Education. This included developing curriculum for the professional training of persons for the liberal ministry, organizing a center for advanced research to support and undergird the curriculum, and launching a publications program. Institutional support for Burhoe's vision fostered the beginning of a Center for Advanced Study of Theology and the Sciences (CASTS) and, in cooperation with IRAS, a new journal, *Zygon*.

In *Zygon,* the proposed publication program of IRAS, which had been abandoned in 1958, became a reality in the joint venture with Meadville. That school provided the necessary resources of personnel, office space, support services, and money to produce the journal. IRAS joined in financial support and provided a wide network of scholars and a source of papers from its conferences. The two institutions contracted to establish the journal through a Joint Publication Board. Representing Meadville were Sutherland, Hayward, and Tapp; representing IRAS were Sanborn Brown, Kirtley Mather, and Burhoe. The twenty-one members of the Editorial Advisory Board also served on the Scientific Advisory Board for CASTS. The services of the University of Chicago Press were secured to produce and distribute the journal, whose first issue was published in March 1966.

Beginning with the first editorial, Burhoe continued to articulate the guiding vision to keep the journal focused on the primary agenda: "imaginatively and informedly to structure theories or beliefs about man, the world, and man's hopes and duties thereunder, which integrate with our new heritage of valid knowledge and, at the same time, effectively operate to supply our religious needs" (Burhoe 1966a, 9–10). With some assistance from Tapp, who was assigned by Meadville to be managing editor, Burhoe drafted the first editorial, which set out the presuppositions, goals, and policies for the journal. "I spent weeks polishing it on Little Whortleberry Island in Lake Winnepesaukee, N.H., during the summer of 1965. It was printed by the University of Chicago Press in the fall as our prospectus for the journal, and sent to a few hundred scientific, theological, and other colleagues to enlist support" (Burhoe 1988). I quote in full the first section, because, as Karl Peters, who succeeded Burhoe as editor in 1979, has said, "these paragraphs give a clear picture of the territory that *Zygon* and its sponsoring organizations are trying to map" (Peters 1987, 44).

Zygon, the Greek term for anything which joins two bodies, especially the yoking or harnessing of a team which must effectively pull together, is a symbol for this journal whose aim is to reunite the split team, values and knowledge, where coordination is essential for a viable dynamics of human culture.

We respond to the growing fears that the widening chasm in twentieth-century culture between values and knowledge, or good and truth, or religion and science, is disruptive if not lethal for human destiny. In this split, the traditional faiths and philosophies, which once informed men of what is of most sacred concern for them, have lost their credibility and hence their power. Yet human fulfillment or salvation in the age of science requires not less but more insight and conviction concerning life's basic values.

Zygon has rich connotations in the sciences, where it supplies the biological term "zygote," designating the union of two gametes or complementary halves of the genetic code essential for the continuation and advancement of life. Here we have the image of two sets of different blueprints for life, each from an ancient lineage. And it is only by their effective yoking that a new generation or a more effective pattern of life can emerge. At the same time, *zygon* has symbolized in religion the union between man and the ultimate reality on which his life depends, as in the Christian "for my yoke [*zygos* in the Greek New Testament] is easy [or good]," or as in the Sanskrit and Hindu cognate *yoga*, meaning union of self with the universal reality.

Ordinarily, in the evolution of human cultures, beliefs and practices about man's most sacred concerns necessarily have been integrated with the concurrent general beliefs and practices—the sciences (philosophies, world views, myths) and technologies. Disruption by historical changes of this integration between basic values and science, or between sacred and secular knowledge, automatically brings about pressures for new adaptations of one or the other or both to reintegrate the organization of the culture. Failure to reintegrate satisfactorily has spelled the death of cultures or civilizations.

One might say that because of its radical mutations the cultural "gamete" from father science has not yet found any corresponding gamete from mother religion with which it can unite to form a workable new culture for future civilization. A valid union may require mutations or reformations in religious belief systems, or further mutations in scientific belief systems, or both. The journal *Zygon* is established as a workshop for those seeking ways to unite, in full integrity, the sciences with what men hold to be their sacred values, their religion (Burhoe 1966a, 1-2).

In his editorials and articles, Burhoe sought to give coherence to the workshop by relating articles by others to the central aims and vision of the journal which were also his own. In the March 1968 issue, Burhoe said that it was time to evaluate the course of the expedition "to reach religion by using the sciences." He pointed out three motivational weaknesses: lack of a clear vision of why religion is necessary to structure and transmit fundamental values, lack of a coherent scientific picture of man and his world yet to be constructed out of the scattered pieces of an unfinished jigsaw puzzle, and lack of sufficient attention to the central religious problems.

We should focus on assembling first those jigsaw-puzzle pieces that look most promising for giving us an overarching sketch of the nature and source of man's central values, duties, hopes, and destiny—the modern equivalent of the central values found in the great religious myths or theologies of the past two or three thousand years. . . . An overarching and religiously relevant vision logically depends on formulations of man's ultimate destiny as far as we can envision it and on what is required of him if he is to have hope for his fulfillment or salvation in the context of the reality upon which he believes he is in the end dependent. . . . If we could agree more clearly on what the source and determiner of destiny is, I think we could then begin to make more rapid progress in reaching our goal of a scientifically grounded religion (Burhoe 1968, 4–5).

Here he made clear the theological ramifications and orientation of the agenda for *Zygon* and its importance for revitalizing religion.

The theological agenda of the journal and Burhoe's leadership did not go unnoticed. Patrick Milburn, in a review of *Zygon,* wrote,

Born of an intense awareness of the cultural crisis of the Western world, particularly as it manifests itself in relation to our Judeo-Christian heritage, *Zygon* has sought to illumine the basic issues which relate theology to the natural and anthropological sciences, and more recently has begun to lay the foundations of a creative, contextual theology for an ethics of the human environment (Milburn 1971, 71–72).

Its weaknesses notwithstanding, he said that *Zygon* was a deeply valuable effort which has been treating some of the most fundamental and exciting issues confronting our contemporary cultural life. The weaknesses Milburn identified related to suggestive directions which had not been explored. In spite of Northrop's suggestive remark that radical immediacy does not warrant belief in a substance of any kind (Northrop 1966, 37) and the amount of attention paid to evolution, he said that in *Zygon* he found the adoption of a substance cosmology with the emphasis on transformation. He did not find that problems with the tautological character of the concept of selection had been explored, especially in the light of work indicating the great potential of individual organisms as agents in the process of evolution. "*Zygon* has presented excellent reviews of present orthodoxy, without engaging in essential criticism." The enterprise was limited in that "there is no effort to envision or evoke the form that mythological thought may take in our time, no efforts like those of Ricoeur or Elizabeth Sewell to engage the mythic as a creative form of thought." He said that IRAS did not seem intent on identifying the kinds of intellectual syntheses that might expose or evoke the symbolic unities, as well as the conceptual principles, which give meaning to human life.

Out of a great toleration, no position has yet emerged which correlates the natural and social sciences with an effective ethics grounded in a renewed theology. . . . Some of the essays seem to suggest great possibilities for a

creative new theology that could take into account current epistemological and ethical questions, and relate these to fertile elements in Judeo-Christian heritage.

This review appeared during a time of creative chaos. Meadville was having to cut back its support for CASTS as well as the journal; CASTS was mutating into CASIRAS; and the viability of *Zygon* was in question for lack of funds. In the March 1972 issue Burhoe pointed out important contributions which helped to sustain the journal for seven years. He singled out Fowler McCormick, president and chairman of the board of International Harvester Company, to symbolize "our debt to many members of IRAS who have given wisdom to the editor as well as money to its *Zygon* fund . . . that has been necessary for the life of the journal." He acknowledged the generous support of Meadville which "made possible the Center and helped bring *Zygon* into being." And he acknowledged the cooperation of the University of Chicago Press and the concern and wisdom of editorial advisers and helpers. However, the journal was in need of a broader base of support so that it might become self-sustaining. "We need help in finding more such people who are ready to wrestle with the difficult problems of attempting to unify our religious understanding with contemporary scientific knowledge so that religion can be more effective in its salvatory function in an age of science." In reference to Milburn's review, he noted that "we have not yet adequately succeeded in fulfilling our aim to provide a genuine unification, yoking, or *zygon* of religion and science." Burhoe concurred with Milburn that humanity's greatest hope and opportunity lie in the development of a creative new theology, although for Burhoe that new theology must extend beyond the Judeo-Christian to the other great religious heritages. He noted that to provide more of the element Milburn was commending, a number of advisers had urged him to publish more of his own papers. Responding to their advice, "beginning about a year ago I have put into *Zygon* several of my papers, hoping thereby to show how the various sciences may be seen to relate to one another and to traditional theology in a coherent or unified view of human destiny" (Burhoe 1972a, 2-5).

Because of the amount of his own writing in the journal, some have perceived *Zygon* as Burhoe's journal. While there is some truth in this, it nonetheless is largely mistaken. Although Burhoe's philosophy guided the journal, he maintained a commitment to scholarly impeccability through the editorial advisory board, which referred submissions, including his own. Burhoe did not operate alone, but only with the concurrence of advisers and the Joint Publications Board. Although these advisers did not necessarily fully agree with

Burhoe's perspective, they did see his thought as representative of the kind of synthesis sought by the *Zygon* community. On his part, Burhoe was the only one bold enough to claim that, for the most part, his developing perspective attempted to represent the synthesis of the tradition of thought exemplified in *Zygon:*

> I am suggesting that the new views held by a number of us associated with the development of *Zygon* represent a new paradigm, a new perspective for looking upon both religious and scientific "truth," that brings both sets of "truth" into a common system (Burhoe 1977, 339).

Because I have found no evidence to the contrary, I do not believe it can be shown that Burhoe was merely promoting his own personal philosophy. Rather, I have concluded that Burhoe was promoting a personal philosophy which he held in common with a significant number of respected scientists, philosophers, and religious scholars. To make the point more strongly, I suggest that if Burhoe had become aware that his personal involvement and writing stood in the way of advancing the program of the new paradigm, he would have dropped out of public view for the sake of that program. As nearly as I can discern, that never was the case. It should be evident from all that has been said that, in spite of differences of opinion, there was support in the *Zygon* community for the general direction of Burhoe's attempted synthesis.[1]

Burhoe encouraged, published, and responded to criticisms of the *Zygon* hypothesis:[2]

> In today's culture, where the greatest aura of factuality is possessed by scientific models of what is true, religious myths or theologies may find a new resource for interpreting the invisible realities. The program set forth as the basis for *Zygon* is to provide translations between the truths latent in traditional religious symbol systems and the scientific symbol systems, thus to restore a genuine aura of factuality (Burhoe 1974, 5).

Although he encouraged critical perspectives, the journal met with difficulties from the University of Chicago Press. Sutherland summed up the problem in his reflections:

> The story of the interplay of individuals and ideologies who began to wrestle for control of the journal is too long to record here, but when it became clear to the University Divinity School that the Publications Board supported Burhoe's editorial policy and expected to retain Burhoe as editor, the Press became restless and the need to find a new "home" for *Zygon* became clear (Sutherland 1987, 24).

This was at a time in which the journal was in a somewhat weakened position. Burhoe had retired from Meadville in 1974, and CASIRAS, although affiliated with the Chicago Cluster of Theo-

logical Schools (and with office space given by the Lutheran School of Theology), had not been funded to support an editorial office to replace the resources given by Meadville through 1974. The editing and production of the journal was in large part the result of volunteer efforts, not the least of which was Burhoe's. In 1975 the editorial team was expanded with four associate editors: Sanborn Brown, Don Browning, Philip Hefner, and Solomon Katz (Burhoe 1975b, 10–11). In addition to limited funds, in 1976 and 1977 Burhoe's failing health (including coronary bypass surgery), contributed to the journal's falling behind in its production schedule.

The situation, which produced a spate of activity and discussion within IRAS and CASIRAS, opened for reexamination the purposes of those organizations and their relationship to *Zygon*. Burhoe vigorously engaged in discussion, encouraging the reexamination, and continued to hold up the vision of the enterprise in terms of the original charters and history. Offers came from the Boston Theological Institute, the Lutheran School of Theology, and Rollins College. One of the deciding factors in the final decision to accept the offer from Rollins College was the need for a new and younger editor to carry on the policies of *Zygon*. Karl Peters, who surfaced as the person most available for the task, had the newfound support and interest of Rollins College in carrying on the *Zygon* project. By the middle of 1979 the transition to a new home for *Zygon* had been accomplished. In brief, the outcome of the reexamination was the affirmation of new leadership for *Zygon,* a renewed vision for IRAS, and a confirmation and rededication of support among the members of CASIRAS.

In his last editorial as editor, Burhoe wrote,

> *Zygon* is a community venture, a community and a venture which it has been my privilege to have served for more than three decades. The community includes all those who have been listed on its editorial board over the years, most of the authors it has published, and a considerable population of conference arrangers and participants. This community has been important for *Zygon* since it has had to generate most of the relevant papers as well as judge their worth in this program for developing a new paradigm for understanding the relation of values and facts (Burhoe 1978, 251).

> The community behind the publication of *Zygon* has opted for interpreting religion in the light of the sciences, the path chosen by Teilhard, although our community began . . . before we knew of Teilhard and has not followed his particular interpretations except by coincidence. We have been an independent group of persons who have sought to be fully scientific and at the same time seriously concerned to understand and if possible to revitalize the religious- and morality-generating institutions of society with the help of scientific interpretation of our need for their function and their truth (Burhoe 1979a, 4).

In his reflections on *Zygon* and the Center, Sutherland said,

> That journal, Ralph [Burhoe] has suggested, is perhaps the most significant tangible contribution the Center has made, and his editorship kept its mission clear and explicit, and consequently saved it from becoming a journal for papers generally in the field of religion and science and more explicitly for papers which might contribute to or challenge the discovery and enrichment of scientifically justified theological affirmations (Sutherland 1987, 24).

Apart from his other writings, *Zygon* is certainly Burhoe's most important work and major contribution to the intellectual grappling with the many problems in adapting traditional religious wisdom to the religious and spiritual needs of persons in an age of science and technology.

The Center for Advanced Study

At the same time that *Zygon* was gaining stature, Burhoe was nurturing the program of the Center for Advanced Study in Theology and the Sciences (CASTS). From the beginning, he had argued that its ideas were too immature and untested for introduction into professional education and needed to be developed in a research center. Thus the Center was an essential component of the New Design and considered fundamental to the effectiveness of the Committee. In addition to research and writing to support and undergird the theological curriculum, the Center was to guide advanced- and post-degree scholars, to conduct programs of continuing education, and to have a publications program (Meadville Theological School 1964, 11). It was the promise of developing such a Center for advanced study, of extending the work he had been doing in his spare time with some members of the Academy (in IRAS and the UUA Commission), that had lured Burhoe to accept leadership for the Meadville project. Sutherland and the Board heartily supported the Center and Burhoe's vision for it, even at a significant financial risk. They committed funds for fellowships to stimulate formation of a critical mass of scholars and for a scholarly publication to disseminate the fruits of research for criticism and utilization by a broader world of scholarship. Burhoe's vision was the guiding light for the Center, as a 1966 announcement of postdoctoral fellowships shows:

> This non-sectarian Center was established in 1964 . . . to encourage an open, imaginative, and informed interacting community of theologians, scientists, and other scholars concerned with examining religious practices, ethical values, and theological concepts in the light of contemporary science. The Center's task is one of reinterpretation and innovation: reinterpretation of the heritage of religion in keeping with the reality picture of the sciences; innovation in religious method and content to meet the demands of a new age. The Center

also includes in its task a continuing assessment of the negative and positive influences of technology and cybernation upon human beings and their value systems today. The ultimate aim is a renaissance of religious synthesis.

Burhoe's developing program for a scientific theology was offered as a paradigmatic option for critical discussion when he presented his "Sketches" in the first advanced seminar in the winter of 1966. As it had in IRAS, his programmatic vision served as the heuristic hub of the Center, giving direction and focus to its program. As noted, one primary requirement was a critical mass of competent scholars and advanced students committed to developing the field. To achieve this and to seek guidance for establishing the Center was the purpose of a proposal for "A One-year Trial Balloon" grant whose opening sentence capsulized Burhoe's vision for the Center: "On scientific and rational as well as intuitive and emotional grounds there is a strong case for the necessity of credible religious beliefs to give structure and direction to individual attitudes and social behavior if any society of men is to be viable" (Burhoe 1965).

Burhoe proposed that twelve fellows, mostly young scholars with some distinction, be selected for one year of work from 1966 to 1967. In the summer of 1966 some twenty distinguished and creative scholars who had made contributions to the field (most of those on the Scientific Advisory Board) would gather with the director and other fellows for a five-week period to chart the course of fruitful research for the coming year. The following summer the group would convene again for a five-week period of evaluation and setting of future goals and program for the Center. Funding was not forthcoming for such an ambitious program, however, the Board provided funds for some fellowships, secretarial services, and *Zygon,* and made office and seminar space available for Center operations to begin in fall of 1966.

For three years (1966 to 1969) the Center functioned on a small scale with only a handful of full-time resident fellows in addition to Burhoe and occasional visiting scholars. Burhoe was gifted at providing a comfortable, congenial working atmosphere, and there were regular weekly seminars (on Fridays) and occasional "extraordinary" seminars. The Center staff, joined by other faculty members and students in an informal "peripatetic college," attended nearby lectures, meetings, and conferences. Kenneth Cauthen, the first postdoctoral fellow, spent a sabbatical year at the Center working on a book which "elaborates an experimental, tentative perspective on nature, history, man, and God designed to fit the present cultural situation" (Cauthen 1969, 9).

In the winter of 1966, Cauthen was joined by Henry Nelson

Wieman, and in spring they were joined by John Ruskin Clark, the first research associate. Clark was given sabbatical by his congregation to work on a book "written in response to the hunger in our society for meaningful and viable religion" (Clark 1977, ix). In 1967 and 1968 there were two postdoctoral fellows. George Riggan, professor of systematic theology at the Hartford Seminary Foundation, took a sabbatical year to study the scientific aspects of the work of Teilhard de Chardin, which was just becoming available (Riggan 1968). He was joined by Donald R. Gentner, who had just finished a Ph.D. in chemistry at Berkeley and now took the opportunity to explore theology and science (Gentner 1968, 432–41).

Administering the Center, Burhoe was in the same role he had served so effectively at Blue Hill and then at the American Academy. His graciousness and great rapport with scientists and scholars contributed to his building of an interdisciplinary community in religion and science. Moreover, his orientation to advanced research (one of the primary reasons he had been brought to Meadville) was also a great strength. He could envision how various forms of research might contribute to the field, and he encouraged persons to explore the relation of their work to religious issues in the seminars of the Center.

In February 1967 the Center began a cooperative effort, with the UUA Department of Education, to develop a third- and fourth-grade curriculum, which in 1971 was published as part of the new Beacon curriculum under the title "*Our Human Heritage.*" From 1968 to 1971 Burhoe and John Godbey participated in the six meetings of an ad hoc group of Midwestern Unitarian Universalist scientists and theologians, called the "Colloquium on Man." Pittsburgh Theological Seminary sought Burhoe's help in organizing a symposium on science and values as part of its 175th anniversary celebration in March 1970. In April 1970 Burhoe attended a meeting of representatives of some thirty-nine institutes and associations concerned about the relationship between theology and the sciences and technology. The meeting resulted in a permanent international secretariat of a seven-person clearinghouse for information and for monitoring further developments (Burhoe 1970a).

In 1968 the retirement of Hayward prompted an evaluation and planning process to decide how to use resources thus released. In the course of that process it became clear that Meadville could no longer give sufficient financial support to sustain the activities of the Center. Riggan joined Sutherland, Donald Harrington (a member of the Board of Trustees), Burhoe, and others in a prolonged evaluation of the Center (Riggan 1987, 31). In 1969, because of increasing finan-

cial problems, Meadville suspended support for postdoctoral fellowships. Alternatives were explored, including working with the University of Chicago Divinity School and the Chicago Cluster of Theological Schools (CCTS) in Hyde Park. There was interest in the work of the Center among a number of scientists and theologians who, though not associated with Meadville, participated in its seminars and other programs.

MUTATION OF CASTS INTO CASIRAS

In the summer of 1970 (four years after *Zygon* first appeared), Burhoe engaged Riggan and Cauthen in extensive discussions to draft a proposal for reconstituting CASTS, to appeal more broadly for financial support as well as attracting staff and students. Of particular note was their concern that the expression "theology and the sciences" was a hindrance in communication. "Life values," "human values," and "human destiny" were among the substitutes entertained for the word *theology* (*human destiny* was preferred because of its futuristic orientation). In February 1971 Burhoe wrote the proposal on the future of the Center, which recommended the expansion of CASTS to offer advanced degree work for the D.Min. and Ph.D. (Burhoe 1971a). It noted the necessity to broaden the base of the Center beyond that of a parochial UU agency in order to attract financial resources, students, and the cooperation of faculty at other schools. It was presented to the Long-Range Planning Committee of the Board of Trustees, which recommended that Burhoe and Sutherland explore ways to implement it.

The outcome, at a meeting at Community Church in New York City on 5 March 1972, was the official founding of the Center for Advanced Study in Religion and Science to replace CASTS. The central aim of CASIRAS was "to formulate a specific and coherent system of belief about human destiny, a 'doctrine of human destiny' which has the necessary credibility to motivate men generally toward a new level of faith and responsibility in the coming world society" (Burhoe 1972d, 172). To accomplish this,

> the Center would seek to bind together in a more or less loosely knit collegium a significant number of those still rather rare and widely scattered scholars and creative minds in various disciplines who have already shown interest in and capacity for constructive integration of the functions and beliefs of religion with the beliefs of the contemporary sciences. . . . CASIRAS might be called an "Invisible College for the Development of Religious Thought in the Light of the Sciences" (Burhoe 1972d, 178).

At its annual meeting in the summer of 1972, IRAS resolved to accept CASIRAS, which was to assume the previous responsibilities of CASTS, as the copublisher of *Zygon,* and it also resolved to expand its membership. Burhoe identified the partnership of IRAS and CASIRAS as that between a membership organization and a center for research and teaching (Burhoe 1973a, 70–71). In October, the second symposium of the IRAS Committee on Science and Human Values was held at the Institute on Man and Science in Rensellaerville, New York, on the theme "Science and Human Purpose." In part, this symposium explored the possibility of relocating the Center, or at least its proposed summer programs, in Rensellaerville. The State University of New York (SUNY) at Albany was another institution excited by the prospect of relocating CASIRAS and establishing a doctoral program in Religion and Science. It too was enthusiastic in their invitation. Burhoe, Riggans, Sutherland and others explored the possibility with considerable care. On 5 February 1973 CASIRAS was fully incorporated in New York as a not-for-profit institution "to study the relationship between religion and science with a view towards integrating religious beliefs and values with the conceptual systems of contemporary science." In September 1973 a grant proposal "for Developing New Moral and Ethical Frameworks," developed in cooperation with the Boston Theological Institute, was submitted to the Rockefeller Foundation. It was hoped that this grant would provide CASIRAS with the funds needed for a five-year program, but the grant was not forthcoming.

In June 1974, the following year, after Burhoe retired from Meadville, CASIRAS and *Zygon* were given office space by the Lutheran School of Theology at Chicago (LSTC). CASIRAS became affiliated with the Chicago Cluster of Theological Schools (CCTS), superseded by the Association of Chicago Theological Schools (ACTS). CASIRAS offered a regular advanced seminar and an occasional M.Div. course. In 1976, with the support of CASIRAS, LSTC included a theology and science specialization in its doctoral program in the theological area. By then, Sutherland and Tapp had left Meadville, thus closing the books on a decade-long effort to incorporate the theology and science area into the regular program at Meadville as part of the New Design for theological education.

Grief and Rejoicing: A Marriage Ends, Another Begins

In 1967 Burhoe's wife, Frances, who suffered from glial cancer, died in August. Burhoe wrote and published a personal account of her

contribution to his life and work and to the larger community, concluding:

> She lived very close to her husband in family and fun, in vocation and avocation. She encouraged him in his wild dreams, which were often ridiculous to others. Four years ago, she encouraged him, even persuaded him, to go to Chicago on another strange adventure to relate religion to the sciences. The pair were knit together tightly by many common bonds, and the pain of separation is terrible.
>
> Our loss of an immediate, personal presence is great; but our gain is great in terms of the continuing manifestations of the crystal jewels, which have spun off from the eddy of atoms that was she, and live within and among us in the larger, ongoing stream of life.
>
> The vision that life begins at birth and ends at death of the body is myopic illusion. The vision that our ultimate concerns and values are confined to this temporal sack of blood and bones is equally short-sighted and the source of tragedy. We humans have to learn anew in the verbally transmitted patterns of our culture what our animal ancestors knew in their genes: that the ultimate values and reality of our life far transcend the brief hour and the small sack that struts upon this stage.
>
> No man is an island, either in the dimension of space or time. The full meaning of life can come to us only when we recognize as the true soul and value of our being, not merely that temporary and only seemingly separate atomic eddy, but more fully and ultimately that larger, immortally advancing pattern, integrated by real and unbreakable ties with the depth, breadth, and length of the stream of life and its cosmic source.
>
> This is at once a scientific and a religious truth. We have not heretofore been clearly enough aware of it, for, without this truth ingrained in both mind and heart, rational men find it difficult either to deal with death or to love their fellow men as themselves (Burhoe 1967).

On Easter Sunday, 6 April 1969, Burhoe married recently widowed Calla Butler. The Burhoes and the Butlers had enjoyed earlier associations at Arlington Street Church in Boston and through work with the UUA. Dana Greeley wrote of their meeting and marriage:

> The open house on New Year's Day [1969] was attended by two old friends at Arlington Street Church, each now left alone because of the death of the partner. Calla Butler was then working in my office, and Ralph Burhoe happened to drop in from Chicago. They met most pleasantly, and I married them on Easter. The wedding would have been at 25 Beacon Street, but Robert Hohler's sit-in against the UUA's investment policies was in full swing at that moment and a substantial attraction and encumbrance at headquarters. . . . [We] went down the hill to King's Chapel for the wedding in the Little Chapel. It was a lovely wedding for two wonderful people, now very much a part of the Meadville family but always of the denominational family as well (Greeley 1971, 75).

Calla gave gracious and energetic support to Burhoe's work, as well as the work of the Center, during a marriage of more than

twenty years that encompassed some of Burhoe's most productive periods.

A Developing Intellectual Structure

The sixteen years following Burhoe's arrival in Chicago—the period 1964 to 1980—were extremely productive. He was sought out for his perspective on the relation of religion and science and for his organizational and promotional abilities. He was involved in organizing conferences, editing *Zygon,* lecturing, and continuing his own research and writing. He also devoted time and energy to promoting a scientific approach to religious problems and to elaborating his own research program for developing a scientific theology.

Burhoe's agenda was to promote religious enlightenment through a rational interpretation of religion in the light of the sciences—that is, a scientific theology. As the rise of the modern sciences has enlightened the human mind to the intricate workings of the natural world and thereby opened new vistas of technological exploitation of the new knowledge thus revealed, so too, he thought, the sciences can enlighten the human mind to comprehend the essential role of religion for human welfare.

> Theology is the attempt to interpret the religious heritage in the most universal and valid forms of rational discourse, which for me and increasing others are the sciences. I find scientific interpretation capable of revitalizing the wisdom hidden in earlier theologies, myths, and mores by making them newly credible. . . .
>
> On the grounds of my approach to theology in the light of the sciences, I feel confident that there will be a revitalization of religion, a religion operative among all peoples and cultures . . . , a religion that is as credible as atoms and gravity, a religion which will harmonize the ideas and behaviors in the various cultures and populations of the world, and enable them to adapt viably to life in a worldwide and transworld community dominated by fantastic evolutionary transformations of genes and cultures (Burhoe 1982b).

During this period, Burhoe worked hard to persuade others of the importance of this agenda.

Again, Burhoe sought to synthesize and integrate into his developing scientific theology the essential issues and results of ongoing discussions of what he called "an invisible college for the study of values and religion." Burhoe's writing, including his published pieces, was done in response to requests—proposals and reports, papers for conferences and seminars, summaries of conferences, topical rationales and questions for focusing a conference or seminar. A few, however, were written for a collection of articles on a

specific topic which did not result from a conference (Burhoe 1973b, 1982b, 1984b).

The Structure of Burhoe's Theology. In a paper sketching the rationale for the work of the Scientific Advisory Board for CASTS, Burhoe presented the following argument. "While the dominant views of the past century have held that religion is a division of culture inherently divorced from that of the sciences, there have been some who hold that he who has found science in opposition to religion has never properly understood either" (Burhoe 1970d, 110). If religions were understood in terms of the basic invariant functions or needs they serve, instead of the culturally relative practices or ideologies in which they are manifested, "the sciences may be as useful for advancing religious theory and for improving religious practice (concerned with the general salvation of man) as they are for medical theory and practice (concerned with human salvation limited primarily to general organic problems)" (Burhoe 1970d, 111).

From an evolutionary perspective, religion can be seen as one among the arts of human culture whose evolution can be described as accumulations of know-how and wisdom, selected, without human design or plan, from among numerous accidental or chance cultural modifications of the genetically based biological systems for maintaining life, by the genetically established conditioned mechanisms of individuals in societies for the relative viability or fitness they bestowed. If we conceive of a logical hierarchy of values, at the peak of which is the most invariant and ultimate value—life—and this hierarchy could be objectively demonstrated, then the religious area would be differentiated in its reality from other areas as that concerned with the adaptiveness of the organism to the ultimate requirements of life. Thus "ideally, and probably to a large extent in fact in history, all the other social institutions and their characteristic arts or technologies may be said to be integrated into the service of the general goals or values set by the religions" (Burhoe 1970d, 117).

Having defined religion as an evolving cultural art whose function is to orient us to the ultimate goals and conditions for life at the top of the hierarchy of values, he said: "Our problem now is: In the light of the new scientific images of the nature of man and the total reality upon which he is dependent, what can be the overarching doctrines for resolving his ultimate concerns?" (Burhoe 1964, 6). Or later, formulated in more scientific terms, "What are or should be the overarching values that order his ultimate concerns?" (Burhoe 1970d, 118). He went on to say that "our primary task is to build a new community of minds in which the new knowledge or information about

facts in general is directly connected with the basic facts about life's values" (Burhoe 1970d, 119). Commenting on method, he wrote:

> I do not view the general method of research in this approach to religious or theological problems through the sciences as being primarily a matter of employing the scientific method at the empirical, testing level to develop new science, at least not for the near future. It would seem more fruitful to consider our problem as one of applying the already scientifically validated conceptual models of "reality" . . . to the problems of religion. In this sense, religious science (theology), like medical science, would be primarily an area of applied science. . . .
>
> The solutions to religious problems . . . are, like solutions to problems of medical health, partially supplied by the following three sources of wisdom: genotypic, organic, and anciently evolved cultural formulas. A fourth source is applied science. . . . I suspect that man's capacity to survive depends on his success in finding a new, rational, and scientific illumination and ordering of these religious problems. . . . It is my belief that the wealth of information in the contemporary sciences . . . offers the best hope to those who would seek viable answers to these problems of man's ultimate concerns or values (Burhoe 1970d, 120–21).

Values. In a number of papers Burhoe elaborated his ontology, epistemology, and axiology in order to make the case that science can study values, that science is the best source of new revelations of the sacred truth about values, that science could provide the basis for a worldwide consensus on values, and that the primary sources for his theology were the sciences, organized to interpret religion and addressed to religious questions. In 1967 he published an exposition of his evolutionary theory of knowledge "to make what seems to me a coherent picture of man's long history of learning to distinguish good from evil." At the end of the paper he concluded that the sciences as the sources of valid information and new revelations were the best hope for finding a renewed authority for values. On another occasion he argued that religious symbolic systems and institutions are the traditional cultural agencies for storing and transmitting evolving sacred goals. Because those symbol systems have not incorporated the new conceptual language and information about values coming from the sciences, we are in danger of losing the essential information for life encoded in those symbols. What is needed is an effective new applied science which would integrate contemporary scientific concepts into a growing system of symbols concerning human goals and destiny (Burhoe 1966b).

In a number of papers he developed the idea that values are a class of facts, a kind of knowledge or information, which are intrinsic to the process of life and give the living agency the capacity to remain in being. Values are the norms and goals embodied in cybernetic

mechanisms of living systems which function to maintain the dynamic homeostatic balance of a system in an ever-changing environment. In "Values via Science" he presented "a plausible outline of how the sciences do in fact reveal and make available to human consciousness much more detail about our human values, their origins, the cybernetic mechanisms (biological and cultural) in which they are encoded, their evolution, and even some visions of how new values may be evolved to transport us to transcend our present humanity." The reason for arguing that the sciences reveal values was given in the next sentence:

> Our most urgent and immediate goal is that of the more rapid evolution of certain elements of our present cultural structures and their integration with the sciences, namely our present cultural programs for transmitting, reforming, and motivating values. . . . In our present ecological system, anything less than an enlightenment of our human values via the sciences portends only increasing chaos and self-destruction of man, and possibly the destruction of much if not all of the values inherent in other biological life (Burhoe 1969, 91-92).

That goal can be accomplished by showing that human values have their source and sanction in the total transhuman environment that has evoked and selected the evolving patterns of life.

Thermodynamics. In a paper by Bronowski (1970), Burhoe found a solution to the problem of connecting the worlds of physics and biology. "Bronowski, in his concept of 'stratified stability,' has at last given a neat physical formulation that underlies all levels of the selective or adaptive process in evolution from atoms to human cultural patterns." For Burhoe, it was a concept of nature which could provide "a generalized and physical model of how the natural selection process works at all levels" (Burhoe 1970c, 39-40). In "Natural Selection and God" he proposed that such a conception of natural selection, extended to cover the whole of cosmic evolution, including all phases of human evolution, was a way of describing the mighty acts of God in history. In this picture nature is sovereign and selects or judges the random, trial-and-error searches of its interacting elements to meet the requirements for stability inherent in nature itself. Progress in evolution is the exploration of adaptive possibilities driven by an entropic energy flow up the ladder of stratified stabilities to ever more complex but stable configurations (Burhoe 1972b, 30-63).

He reflected on a number of areas where he saw the gropings of the evolutionary process toward new levels of complexity, perhaps leading to some transhuman species as in the possible case of an emerging symbiosis of humans and computers (Burhoe 1972c). He

considered simply mistaken the claims that humans are in control of their destiny. Whether in managing human behavior to promote environmental health (Burhoe 1972e) or in the development of new genetic technologies, it is the same nature which has selected and incarnated value in the evolutionary progression of living systems that will continue to select viable systems in the future (Burhoe 1971b). In world-system modeling he saw an attempt, similar to his own, to comprehend the system that ultimately determines human destiny. He suggested that a missing but crucial aspect was consideration of the ultimate human values evolved in religious traditions. He predicted that the motivation to establish widespread human behavior in accord with the long-range values needed to avert projected catastrophe would await the revitalization of religion. "This is not likely to take place until the wisdom already evolved within the traditions is translated and interpreted within today's more extended and credible views of man and the world developed by the sciences" (Burhoe 1973d, 182).

Evolution of Religion. Burhoe thought he foresaw the evolution of religions in the chapters he contributed to *Science and Human Values in the 21st Century* (Burhoe 1971c). At the end of that book he prophesied that twenty-first-century values will come from a scientifically based theology that creates a common world culture:

> I prophesy that each of the religions will tend to be resurrected or revitalized and transformed as it effectively translates the viable wisdom of its tradition into this new symbol system of the sciences, and as it reforms and extends the traditional wisdom to adapt human living to the requirements for living in the new one-world culture of increasingly closely interdependent billions of people on Spaceship Earth. . . . So long as the scientific-technological world view continues to spread, natural selection as it operates in cultural evolution is going to weed out the religions that are unfit for motivating men to ordered or viable behavior in that world (Burhoe 1971c, 184–85).

The cornerstone for human and all other values is the concept of God. That there is a God who selects and ordains human destiny has been a central message of the religions of the world, and this concept is confirmed in the scientific myths of a lawful cosmic evolution:

> Every creature is constantly seeking new and better adjustments. The progress of life's development from molecules to men, and from infants to men, is the result of constant trials in search of what the Lord ordains. It is written in our very genes that we, who are in so large part graced with life because of what they program for us, must constantly seek to adapt ourselves in new and better ways to the requirements laid down by the larger nature or Lord for the further development or evolution of life. Those individuals and species of life who do not constantly seek to adapt to the sovereign requirements of what must be done

to remain in being simply are among those who once were and no longer are (Burhoe 1971c, 198–99).

He concluded the book:

> Human values are set by the natural Lord God Almighty, not by man. For man is a blade of grass that grows in the day and is gone by night, but the total system of reality or nature reigns forever. Man's privilege and man's only hope is to adapt, to serve the will of the Lord.
>
> Such a vision is not novel except for the conviction with which it may be held in the twentieth century by one who finds it revealed in the scientific myth of creation. Such a vision may allow one to try to bring about a reformation of theology in the light of the sciences without total assurance that it will come in time, or that it will come at all.
>
> Our task is forever to discern the will of the Most High and then seek to fulfill it, forever confessing our errors and reforming our ways (Burhoe 1971c, 202).

The Concept of Soul. Burhoe's paper, "The Concepts of God and Soul in a Scientific View of Human Purpose," for the Symposium on Science and Human Purpose in October 1972, marks a watershed in his research and writing. In that paper he said: "For understanding human purpose not only do we need a doctrine of the scheme of things that ultimately determines human destiny, but also we need to understand man as an element of that system" (Burhoe 1973c, 432). He argues that a concept of soul is necessary to provide the proper understandings and feelings to motivate individual humans in service of the purposes ordained for their evolution by God—the ultimate system that selects or determines destiny. In his subsequent papers he tended to focus more extensively on that which is essentially human. For example, he focused on the individual human in "The Nature of Man as a Niche in Nature and as an Image of God" and sketched three stages of the human soul: the ecosystemic stage, as the ultimate source of the soul; the biogenetic stage, as the ground of religious experience; and the sociocultural stage, which has given man a soul essentially different from that of all previous creatures. At the end, he gave the following image of human nature in relation to God:

> Salvation is to perceive the glory of God's kingdom and to glory in participating in its continual building. God's kingdom is the succession of actual or real states of the world, among which are the actually selected or ordained ecological niches of life. Man's nature could be likened to an infinite, inverse riverbed in time, a niche in nature through which course God's ever given dissipative streams of energy, destined by God's nature ever to form more complex structures higher above the previous levels of thermodynamic equilibrium (Burhoe 1971c, 202).

God. In another context, Burhoe in fact drew up a list of attributes for God:

Among the main features of traditional attributes or characteristics of *God* as the ultimate reality that determines human destiny are:

1. *God* is the one and only ultimate reality surrounding and infusing man, which created man, and upon which man is utterly dependent.
2. *God* has revealed in part *God's* requirements of and *God's* disposition to men; hence, *God* is not wholly hidden, alien, or mysterious.
3. Yet *God* is in large part hidden, transcendent, beyond what man can fully understand—"supernatural"; hence, the ultimate mystery of *God.*
4. *God* is lawgiver, the reality or power that determines what is right and wrong, and has incarnated or revealed in large measure (by a grace sufficient for the day) the requirements for good and what is to be avoided as evil in the hearts and traditions of creatures.
5. But *God's* continuing program of creation of ever-new stages calls upon most evolving creatures to seek new as well as abide by the established requirements that are still valid—or else disappear from the scene.
6. The guarantee or justification for the hope of the ultimate triumph of *God's* purposes and of all creatures who participate in them, even though any present situation may seem to be disastrously short of this triumph, is revealed by a careful reading of *God's* mighty acts in the past 6×10^3 years.
7. *God* is gracious to man; that is, without any merit on man's part, man has been raised up from the dust and perennially sustained and redeemed from his errancy and given the opportunity to be a conscious cocreator of *God's* evolving Kingdom of Life, as long as man seeks, finds, and executes *God's* requirements (Burhoe 1973c, 422).

In addition, Burhoe says:

In "Natural Selection and God," I have tried to make clear that the scientific pictures show man to be as much a product or creature of a transcendent determiner of destiny as ever the religions hypothesized (Burhoe 1973c, 420).

Inculturation and Freedom. Another schematic presentation is given in "The Civilization of the Future: Ideals and Possibility" (Burhoe 1973b), where he discusses the ideas that civilization is a remarkable system or ecological niche for rapid learning of better ways to live and that the organizing center of a civilization is the human brain. In the human brain are synthesized biological information from the genotype and cultural information from the culturetype. The essential component which gives civilization its character as a system of life is the common culturetype, programmed into each brain in the population. Religion is the agency for enculturating the primary values of the culturetype, without which a culture would cease to be viable.

In an insightful essay occasioned by an IRAS conference on the "Humanizing and Dehumanizing of Man," Burhoe joined with Alfred Emerson to explore the "Evolutionary Aspects of Freedom,

Death, and Dignity." Beginning with the definition of freedom as "the liberty to vary that allows choices among alternatives," they explored examples of biological variations and cultural analogues. Because nature imposes restrictions on such freedom to vary, living systems evolve toward the capacity to make choices that are partially preadapted to the conditions which nature imposes. In the human brain, where patterns of choosing are guided by genetic and cultural information, there has evolved the largest capacity of freedom to make viable choices. In their concluding summary they said:

> Man is dependent on the cumulative adaptations of plant, animal, and cultural evolution for the genetic and cultural information that has brought him up from the primitive plants, animals, and societies to his emergence toward increasing social cooperation and high civilization. Contemporary humanity has risen from earlier cultures by means of qualitative and quantitative advancement of emotional and intellectual brain capacities resulting in ever increasing symbolic communication among integrated subcultures. . . . Scientific information seems to reinforce certain elements of religious tradition and may help to provide enlightenment for a more rapid advance in religion's further evolution. Science itself could not survive in a society in which viable motivations for living were not enculturated. It behooves the sciences to take a hint from the evolution of the brain of man not only to provide abstract or incidental information but also to serve humanity's ultimate concerns (Burhoe and Emerson 1974, 179).

A Progress Report: "The Lord of History." In 1975 he published "The Human Prospect and the 'Lord of History' " (Burhoe 1975c). That long essay and its sequel, "What Does Determine Human Destiny?—Science Applied to Interpret Religion" (Burhoe 1977), which is a response to critics, represent a drawing together of his scattered writings and lectures into a kind of progress report on his proposal for a scientific theology. Responding to the challenges of Robert Heilbroner's *Inquiry into the Human Prospect,* Burhoe elaborated "a scientific picture of religion that will be convincing to the scientific and skeptical minds who have not been provided with much scientific evidence for its virtues and potential" (Burhoe 1975c, 304). He gave an evolutionary interpretation of religion from its ancient biological roots to the emergence of a scientific theology:

> The primary point of this paper is to show that now there seem to be dawning in the recent pictures of man and his relation to the "ultimate reality" as portrayed by the sciences a clarification and substantiation of the basic insights of the great religions, but with much more concrete detail and evidence. It is this synthesis to which I give the name "scientific theology" (Burhoe 1975c, 349).

Central to his interpretation was the thesis that religion is the agent in cultural evolution that has transformed the basic perspectives

and motivations of a genus of apes into social and spiritual humans capable of high civilization. The substantiation of the thesis depends upon the hypothesis that there is a selective process operating on sociocultural systems, analogous to biogenetic selection, which can explain the evolution of humans as a symbiosis of genetic and cultural information.

That thesis was further developed in two papers responding to and building upon Donald T. Campbell's controversial presidential address to the American Psychological Association, "On the Conflicts between Biological and Social Evolution and between Psychology and Moral Tradition." Its opening sentence was:

> A major thesis of this address is that present-day psychology and psychiatry in all their major forms are more hostile to the inhibitory messages of traditional religious moralizing than is scientifically justified (Campbell 1975, 1103).

In "The Source of Civilization in the Natural Selection of Coadapted Information in Genes and Cultures," Burhoe sought to extend Campbell's interpretation of the function of religion to provide a socially cooperative behavior that genes alone cannot accomplish:

> Not only shall I assert the functional utility of religion for social cooperation, I shall move toward demonstrating that the conceptual schemes or myths of religion—about superhuman gods who punish the doers of certain evils and reward the good—that have been selected in cultural evolution are perhaps truer, not only more necessary for societal functioning but also more valid as "ontological" hypotheses, than most modern intellectuals have supposed (Burhoe 1976a, 265).

This paper is of special significance for its elaboration of the concept of coadaptation for understanding the joint operation of selective processes in the physical environment, the genotype, and the culturetype. "The human brain is the integrating mechanism within which three levels of nature are coadapted to produce human nature" (Burhoe 1976a, 281).

For a symposium on sociobiology and religion in 1978, Burhoe defended the thesis that religion is the key and hitherto missing link in the scientific explanation of how ape-men are transformed into civilized altruism. The motivation for defending the thesis was expressed in his opening paragraph: "I am concerned with the development of a more adequate scientific theory of religion, which perchance might revitalize religious belief, reverse a decline in altruism, and prevent a new 'Dark Ages.' " And in the conclusion he said,

I shall conclude by calling attention to the fact that it also follows from this hypothesis concerning the origin of human civilization that religions or some functionally equivalent cultural agencies are essential for any civilization at any stage, including ours, since, beginning with their genetically based rituals and on through myths and theologies, they are the cultural source of coadapted basic values which motivate that genetically selfish ape-man to serve his symbiotic sociocultural organism (Burhoe 1979b, 157).

Thus not only was a scientific theory of religion's role in human evolution necessary to explain the emergence of altruistic cooperation, needed to account for the evolution of civilization (what E.O. Wilson called the "culminating mystery of all biology" [Wilson 1975, 362]), but also it implied that religion, in some form, was essential for the viability of civilization in the future. Thus for our age, threatened with the loss of our religious heritage because of its incredibility in the scientific mind, we need a scientific theology which can revitalize the ancient wisdom about the ultimate destiny and purpose of human life.

THE TEMPLETON PRIZE FOR PROGRESS IN RELIGION

Through his work with the Academy, IRAS, Meadville, CASIRAS, and *Zygon,* Burhoe developed a network (an "invisible college") of a large number of highly respected specialists and scholars in a wide range of disciplines. He devoted great energy both to intellectually relating the contributions of these specialists to his vision for a scientific theology and to providing the organizational structures and opportunities to facilitate communication among these specialists in a congenial atmosphere that was nevertheless conducive to serious intellectual engagement concerning the relation of religion and science. In recognition of his efforts, Burhoe was awarded the prestigious Templeton Prize for Progress in Religion in 1980

for his contributions to the contemporary dialogue between science and religion. During a period when conversation between religion and science was unfashionable, Ralph Burhoe, in his writings, his organizational and promotional skills, and his great personal rapport with both scientists and theologians, has been at the center of a growing discussion, international in scope, and of momentous importance. No other person in the last two decades has had the cumulative impact on this dialogue between professional religionists and scientists as has Ralph Burhoe. His contribution to progress in religion is found in the fact that he, more than any other person now living, has helped to turn modern societies from the growing separation between science and religion and has helped some of our top scientists and theologians move into conversation once again. In addition, he has made theoretical contributions, now receiving international attention, of the highest order towards translating religious truths into scientific concepts. He has worked to show, on broad scientific grounds,

the relevance of religion to man's adaptive and moral struggles (Browning 1980).

The Templeton Prize was established in 1972 by John M. Templeton, an American financier, investment adviser, and active Presbyterian layman, because, as he expressed it, "we are trying to say to the world that progress in religion is even more important than progress in anything else—or even all things combined." The prize, the world's largest monetary award, is given in England each year under the patronage of Prince Philip. As the foundation described it,

> The objective of the Templeton Foundation Prize is to stimulate the knowledge and love of God on the part of mankind everywhere. . . .
>
> Progress is needed in religion as in all other dimensions of human experience and endeavor. There has been a long departure, at least in Western culture, from the last synthesis when religious knowledge and scientific knowledge were organically related. It is imperative that progress in religion be accelerated as progress in other disciplines takes place. A wider universe demands a deeper awareness of the dimension of the spirit and of its spiritual resources available for man, of the immensity of God, and the divine knowledge and understanding still to be claimed.
>
> The Templeton Foundation Prize serves to stimulate this quest for deeper understanding and pioneering breakthrough in religious knowledge by calling attention annually to the achievements that are being made in this area. It is hoped that there will result from this enterprise a deeper spiritual awareness on the part of men, a better understanding of the meaning of life, a heightened quality of devotion and love, and a greater emphasis on the kind of dedication that brings the human life more into concert with the divine will, thus releasing new and creative energies into human society today (Templeton Foundation 1980).

The first award winner, in 1973, was Mother Teresa of Calcutta. Other winners have been Brother Roger of Taize (1974); Dr. Sarvepalli Radhakrishnan, former president of India (1975); Cardinal Suenens, archbishop of Malines-Brussels (1976); Miss Chiara Lubich (1977); Mr. Nikkyo Niwano (1979); and Billy Graham (1986).

There has been some controversy regarding the establishment of the prize and the process for awarding it. Some were of the opinion that Templeton could have promoted progress in religion in other and better ways than by establishing an annual prize. However, it is well known that science-and-religion is one of Templeton's primary areas of interest, as attested by such typical recipients of the prize as Thomas F. Torrance (1978), Burhoe (1980), Alister C. Hardy (1985), Stanley L. Jaki (1987), and Charles Birch (1990). Templeton was also supportive of the project to establish the Center of Theological Inquiry in Princeton, New Jersey (under James I. McCord),

to find common bases for science and religion by bringing scholars from various academic disciplines together for exploration and discussion (Briggs 1984).

In his 1981 book, *The Humble Approach: Scientists Discover God,* Templeton wrote,

> Every person's concept of God is too small. Through humility we can begin to get into true perspective the infinity of God. This is the humble approach. . . .
>
> This book explores the possibility that humility in man's understanding of God may be more fruitful than formal systems of thought which we have inherited, whether they be theistic, pantheistic, or panentheistic. Gradually we may learn to love every one of God's children and be grateful for an increasingly rich diversity of thought emanating from research and worship in every land. One of the purposes of this book is to examine and foster the idea that through a humble approach in knowledge in which we are open-minded and willing to experiment, theology may produce positive results even more amazing than the discoveries of scientists which have electrified the world in this last century. . . .
>
> By reading and writing in this [important and developing] theological field [of science and religion], scientists and other laymen may not only enhance their own spiritual growth but also stimulate progress and expand the whole field of theology in ways that may benefit all. Let us hope that already a spiritual and religious renaissance may have started, and that a great new day may be dawning (Templeton 1981, 3-5).

Templeton also refers to Burhoe's work as "an even more exciting vision of a new theology now being born called the Theology of Science." Templeton attended a Star Island conference and was evidently impressed by the kind of inquiry being stimulated by IRAS. Burhoe was selected by the Templeton Foundation to be nominated for the prize, and in the spring of 1979 Don Browning, of the University of Chicago Divinity School and an associate editor of *Zygon,* was asked to write a nominating letter.

Although some have said that the prize was somewhat discredited because it was awarded to Burhoe, others maintain that such criticism is based solely on ideological differences with the positivistic, naturalistic, and evolutionary philosophy undergirding Burhoe's program. Indeed, such criticisms are similar to those negative reactions to Burhoe's philosophical and methodological commitments which inhibited the program at Meadville and threatened the flourishing of *Zygon,* when adverse forces at the University of Chicago expressed dissatisfaction with Burhoe's editorial policy, which led to the decision of the Press to terminate its agreement to print and distribute the journal. It is also possible that similar ideological differences with Burhoe's vision for revitalizing morality and its religious base in the light of scientific knowledge were at the root of the rejection of the numerous proposals for funding a center for

advanced study, in spite of the eminent scholars and scientists who gave their support to them. Burhoe wrote of the relationship between those proposals and the Templeton Prize as follows:

> While CASIRAS vigorously sought funds to finance a sizable and nationally or internationally active center, it seems that most foundations and other institutions that might support CASIRAS have remained up to the present largely incredulous that the sciences could enhance the interpretation and effectiveness of religion or morality. A notable exception was the unsolicited 1980 award of the more than $200,000 Templeton Foundation prize for progress in religion to Burhoe, essentially for the work he had accomplished through *Zygon*, IRAS, and CASIRAS. But most secular foundations and academic institutions seem to feel that religion is only an archaic vestige that must be ignored and will be replaced by a secular ideology, while the religious funds and institutions largely have felt that the sciences are either irrelevant or a dangerous threat to religion, but seldom a resource (Burhoe 1987a, 8).

The Templeton Prize bestowed the long-overdue accolades and well-deserved recognition for Burhoe's work in stimulating the renewal of dialogue between scientists and theologians, as well as his theoretical contributions which helped give shape and coherence to the growing conversation. Indeed, Templeton honored Burhoe with the attributes of visionary and missionary:

> Dr. Burhoe is not only a scientist and a theologian; he is also a visionary and a missionary. He is a missionary for a new reformation, a reformation which may be far more profound and revolutionary than the reformation led by Martin Luther. The vision of Dr. Burhoe is the evolving ancient scriptures (Templeton 1980).

And Lynden Pindling, prime minister of the Bahamas, introduced him by saying,

> Dr. Burhoe, your presence here today as the recipient of the 1980 Award of the Templeton Foundation Prize for Progress in Religion is an indication that the judges of the award, who themselves come from the major religions of the world, feel that you have succeeded, that you are a pioneer, a living example of the resourcefulness of the human mind to continue the quest. Clearly you have demonstrated that the task of creating an acceptable scientific theology has only begun. A beginning which, I am confident, will lead you and your successors to establish a basis that will bolster the faith of many, will enable mankind to be revitalised in the faith and will lead to a better understanding between the peoples of the world (Pindling 1980).

WORK AFTER 1980

After 1980, Burhoe continued to elaborate and refine his position, most notably in five recent essays. The first paper, "Pleasure and Reason as Adaptations to Nature's Requirements," written for a symposium on "Private Interests, Public Good, and the Future of

the Environment'' in 1981, argues that there is a need in twentieth-century politics and technology for the revitalization of sound religion to provide the noncoerced, cooperative social behavior necessary for the continued health of the commonweal (Burhoe 1982a).

The second paper, written for the Unitarian Universalist *Advance*, ''True Spirituality in the Light of the Sciences,'' is one of the few discussions of the nature of spirituality and religious education in Burhoe's works. True spirituality is built on the coadaptation of our genetic heritage, which structures the instinctual rituals, emotions, and feelings in the lower or inner-brain responses, and our religious-cultural heritage, structured by religious education in the outer cortex. To meet the spiritual needs of a scientific technological environment is the next challenging step in human cultural evolution, and this will require ''a reformation of understanding or doctrine, and its propagation, to make possible a union of the spiritual functions and wisdom of the past with the cognitive knowledge of the present'' (Burhoe 1981, 16).

An address for the First Unitarian Church of Pittsburgh, Burhoe's third recent essay, is a good outline of his basic theory about the importance of religion in human evolution. It

> sketches some elements of a fairly widely substantiated picture compounded from various sciences on how religion became a central, forever necessary element of human nature by its role in the coadaptation that forms a mutually beneficial symbiosis between the hominids and the new transgenetic kingdom of life that emerged in hominid brains as shaped by cultural information (Burhoe 1984b, 11).

In his fourth paper, a chapter for *Cry of the Environment,* a book of religious and ethical resources for rebuilding the Christian creation tradition to deal with the mounting problems of environmental abuse, Burhoe wrote one of his clearest presentations of his position: ''a new synthesis of the concepts underlying *evolutionary creation* with *traditional concepts of God.*'' There he argued the thesis ''that the present environmental crisis, like many other human crises, stems primarily from the failure to communicate our religious tradition's concept of our creator credibly to a scientific-technological world'' (Burhoe 1984b, 218).

The last and most recent published paper of significant note is his ''War, Peace, and Religion's Biocultural Evolution,'' which carefully presents the essence of Burhoe's theory of religion in relation to world peace:

> If my thesis is correct, that religion is the universal source for internal harmony and cooperation within a society, then one should recognize that all the world's religious cultures, at the underlying level of their basic values, can be interpreted properly today only as a single, universal set of values, common for humanity, even though quite differently expressed in various times and places. This is exactly what is required for the coming one-world village to exist in peace (Burhoe 1987b, 462–63).

It needs to be emphasized that the "problem" of world peace was a fundamental motivation for scientists and scholars at the American Academy of Arts and Sciences who were concerned about science and human values in those formative years when Burhoe was executive officer for the Academy. World peace was also a central concern for the religious leaders of the conferences on the Coming Great Church. It was the coming together of persons in both of these groups that led to the formation of IRAS, which was heir to their concerns and became the center of the tradition which has been traced through Meadville, CASTS, CASIRAS, and *Zygon*. In a real sense, this 1987 article embodies the spirit and wisdom of the forty-year tradition (from 1947 to 1987) which supported, sustained, and tested Burhoe's attempt to formulate his vision for a scientific interpretation of religion as a way of human salvation in the twentieth century.

CONCLUSION

Burhoe's vision for a creative and new theological paradigm in a research and teaching center (Meadville/Lombard) as part of a New Design for theological education did not have the anticipated results. Nonetheless, significant progress was made. IRAS expanded into a membership organization and had broadened its connections by affiliations with the American Association for the Advancement of Science and the Council for the Study of Religion, and had a new generation of leaders. In *Zygon,* the publications program became established as a recognized vehicle for communication among an international community of persons interested in the interpretation of religion in the light of the sciences. The editorial torch had been passed from its founder, and the journal seemed to have a firm foundation of institutional support with its connection to Rollins College. A small volunteer research group, an "invisible college," was functioning in CASIRAS, with its connection to the Lutheran School of Theology and the Cluster of Chicago Theological Schools.

Burhoe's commitment to elaborate and defend his unification of scientific knowledge and traditional religious wisdom through an interpretation of religion in the light of the sciences met resistance

largely from those professionally concerned with religious tradition and scholarship. This resistance thwarted his efforts to establish an institutional base. Burhoe was not amenable to compromise and did not encourage a variety of approaches, which a number of persons have seen as a praiseworthy integrity in his commitment and have suggested that his efforts to guide research and discussion along *his* approach prevented the enterprise from becoming too broadly defined and diffuse. In addition, his theoretical work engaged the most prominent issues in the sciences, notably on the relation of biological and cultural evolution, and thus captured the attention and imagination of scientists and a few theologians. Grand in scope, his theory of biocultural evolution is one of very few proposals which can engage theologians, scientists, and philosophers in a discussion of crucial issues concerning religion and values.[3]

EDITOR'S AFTERWORD

Although increasingly hampered by poor health and restricted to his local environs, Ralph Burhoe continued to be active through 1990 in reading, writing, attending Chicago-area meetings, and consulting with individuals and groups. IRAS and *Zygon* continued to thrive; the journal's editorial offices moved to Chicago and the editorial team was substantially augmented with the addition of Philip Hefner as editor in chief and Carol Rausch Gorski as executive editor. Assistant editor Diane Goodman moved from Florida to assume additional responsibilities in the editing process. Burhoe and CASIRAS joined with the Lutheran School of Theology at Chicago (LSTC) to establish the Chicago Center for Religion and Science (CCRS) in January 1988, under the leadership of theologian Philip Hefner and physicist Thomas Gilbert. CCRS houses the *Zygon* editorial office and has continued among its activities to host the annual Chicago Advanced Seminar in Religion and Science that Burhoe began in 1966 at Meadville. CASIRAS was reorganized in December 1989 in order to enhance its effectiveness in the religion-and-science field. Solomon Katz succeeded Donald Harrington as its president, and its membership was substantially increased.

NOTES

1. In a memo to me in March 1987, Burhoe wrote, "If I had not the support for my ideas insofar as they touched the concepts of their own theoretical systems as very credible by some of the greatest intellects of their fields, I never would have had the courage to develop my youthful vision that religious and scientific belief could be unified. My view is a radically new paradigm. Like many past developers of radically new paradigms, I may have to die generally unknown and unaccepted before there are sufficient testings to make recognition possible. But I am still testing and stand ready to test my views

against the most recent developments in the various sciences and studies of human nature, religion, and science. My "War, Peace, and Religion's Biocultural Evolution" . . . was sent out in manuscript to several of the people whose judgments and corrections I felt were necessary before publication. These included people near the tops of their fields . . . such as Don Campbell, Paul McLean, Ladd Prosser, George Pugh, and Roger Sperry. I and the paper were greatly helped by their careful reading, their substantial responses, and their general encouragement."

2. For example, see Burhoe 1974, Burhoe 1975a, and the March 1977 issue of *Zygon: Journal of Religion and Science* on Burhoe 1975c, to which he responded with Burhoe 1977.

3. The gist of this comment has been attributed to James M. Gustafson in a number of informal conversations. Cf. his "Theology Confronts Technology and the Life Sciences," *Commonweal,* (1978): 391, and his *Ethics from a Theocentric Perspective,* vol. 1, *Theology and Ethics* (Chicago: Univ. of Chicago Press, 1981), p. 258.

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