

IRAS

**Knowledge Most Worth Having in the
Decade of the Brain**

Program and Schedule

Institute on Religion in an Age of Science

41st Annual Star Island Conference, July 30 to August 6, 1994

Conference Statement

When the President and Congress designated the 90s "The Decade of the Brain," they recognized not only the tremendous advances being made in the neurosciences, but also that this new information speaks directly to core questions of our society: What are the sources of the self, and what confers meaning and worth on individual lives?

A pluralistic society interested in the brain comes with its own goals, preconceptions, and values. The best way for neuroscience to illuminate the most profound questions of what it means to be human is not to negate these goals, preconceptions, and values, but somehow to re-integrate them with those of the time in which we must negotiate authentic lives.

Neuroscience in the past 20 years has taken great strides toward helping us understand ourselves as linguistic beings. We have begun exploring new horizons of knowledge and potential therapies using transplants and grafts into the human brain. We are learning the nature and causes of severe depression and schizophrenia which afflict a sizable proportion of this society. Precisely because this progress offers help to many people who are close to us, affects deeply held values, and is already transforming our self-understanding, this conference will offer the best information and opportunity for the serious reflection that these topics demand.

The conference will focus on topics that are central to both modern neuroscience and modern society, and will present current information and perspectives on them by recognized scientists, theologians, and ethicists.

WELCOME TO STAR ISLAND!

It is my pleasure to welcome those of you who may be on Star Island for the first time and/or at an IRAS conference on Star Island for the first time. All of us "old shoalers" well remember that mixture of being astonished by the beauty of the place and very confused about the location of the Sandpiper Room. I can promise that the confusion abates and the beauty persists.

There is no one way to participate in an IRAS conference. Each participant discovers her/his optimal combination of intellectual, spiritual, and recreational exploration. Some of us actively seek friendships. Others revel in long-sought solitude. Some focus the week on an individual creative project. Others participate creatively in group discussions and activities. What emerges is a shared sense of discovery, which keeps many of us coming back year after year.

I very much hope that you will introduce yourself to me at some time during the week so I can come to know who you are and help in any way to ensure that your time here is thoroughly enjoyable and rewarding.

Ursula W. Goodenough
President of IRAS

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ORIGIN AND PURPOSE OF IRAS

In the late 1940s the American Academy of Arts and Sciences organized a Committee on Science and Values to address topics relating contemporary scientific knowledge to fundamental human concerns about life's morals and meanings. The Committee, which included astronomer Harlow Shapley, neurobiologist Hudson Hoagland, geologist Kirtley Fletcher Mather, biologist George Wald, and Ralph Wendell Burhoe, the executive secretary of the Academy, stated that "we believe that . . . the survival of human society depends on the reformulation of man's world view and ethics, by grounding them in the revelations of modern science as well as on tradition and intuition."

Several from this committee accepted an invitation to bring their views to an interfaith group at the Coming Great Church Conference on Star Island in the summer of 1954. Later in 1954 the group from the American Academy accepted an invitation of the Coming Great Church Conference to form the Institute on Religion in an Age of Science, a multidisciplinary society, which carried forward the work of both predecessor groups. Other leaders involved in the establishment of IRAS included Brand Blanshard, Edwin Prince Booth, Dana McLean Greeley, Donald Szanthe Harrington, Henry Murphy, Lyman Rutledge, and Malcolm Sutherland.

Since 1954 IRAS has held an annual conference on science, values, and religion on Star Island, ten miles off the coast of Portsmouth, New Hampshire. IRAS has also conducted--on its own or in collaboration with other groups--conferences in other places: at universities and theological schools, and at meetings of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, and the American Academy of Religion.

In 1965 IRAS joined with the Meadville Theological School of Lombard College (later Meadville/Lombard Theological School) to establish a journal: *Zygon: Journal of Religion and Science*. The first issue was published in March 1966 under founding editor Ralph Wendell Burhoe, director of the newly formed Center for Advanced Studies in Theology and the Sciences (CASTS) at Meadville/Lombard. In 1979 when Karl Peters succeeded Ralph Burhoe as editor, the editorial offices moved to Rollins College in Florida; IRAS, the Center for Advanced Study in Religion and Science (CASIRAS--successor to CASTS), and Rollins College became joint publishers. In 1989 the editorial offices moved back to Chicago under the editorship of Philip Hefner, director of the newly formed Chicago Center for Religion and Science. During the past quarter century, *Zygon* has been the chief international voice for the scholarly community in science and religion, and has greatly strengthened the influence of the IRAS-CASIRAS approach to relating religion and the sciences.

IRAS is a society of natural scientists, social scientists, philosophers, scholars of religion, theologians, and many others who seek to provide a forum for discussing issues of relevance to religion in an age of science. In its Constitution, the IRAS purpose is stated as follows:

The Institute on Religion in an Age of Science is established:

- (1) to promote creative efforts leading to the formulation, in the light of contemporary knowledge, of effective doctrines and practices for human welfare;
- (2) to formulate dynamic and positive relationships between the concepts developed by science and the goals and hopes of humanity expressed through religion; and
- (3) to state human values in such universal and valid terms that they may be understood by all peoples, whatever their cultural background or experience, in such a way as to provide a basis for world-wide cooperation.

The Institute is to carry on the work initiated by the Conference on Religion in an Age of Science, first held on Star Island, off Portsmouth, New Hampshire, USA, July 31 to August 6, 1954, and to engage in the development of such additional conferences, lectures, study groups, seminars, research projects, publications, etc., as may be useful for its purposes.

IRAS is a non profit membership organization. Governance is by a volunteer Council whose members are elected from the entire membership. New IRAS members and tax-deductible contributions are always welcome.

IRAS ON STAR ISLAND

Star Island, first settled by Captain John Smith in the early 1600s, is situated in what was known as the best fishing grounds in the Colonial world. Today one can still see the lobstermen setting their traps. A small museum and island tours allow one to recapture this early human history; and tours of the local flora and fauna, tide walks, and a marine biology lab help one appreciate the local environment.

Because it is ten miles off shore from Portsmouth, New Hampshire, Star Island's temperature is usually ten degrees cooler than on the mainland. It thus became an ideal resort setting for one of the premier late-nineteenth century hotels on the east coast. Today the hotel, along with several cottages and motel-type units, is a conference center run by the Unitarian-Universalist Association and the United Church of Christ; these two religious organizations have formed the Star Island Corporation. Although IRAS is not affiliated with any particular religious organization, we have enjoyed the hospitality of the Star Island Corporation since our first IRAS conference in 1954.

The nineteenth century hotel and other facilities provide both the charm and the amenities of that period. Rooms are provided with wash basins and water buckets, and in most cases the toilet is down the hall. The Star Island management and its staff of mostly college students--called Pelicans--are first rate in meeting the various needs of guests from infants to octogenarians. A highlight of the week is the Pelican Talent show--a delightful "extra" from the hard-working staff. And in recent years IRAS conferees have returned the favor with their own talent show on the final night of the conference.

Star Island and other islands in the Isles of Shoals are excellent examples of the rocky New England coast. There are no roads, no cars, no bicycles, no phones (except a ship-to-shore radio-phone for emergency use), and no TVs. But there are rocks, bushes, grasses, nesting sea gulls, crashing ocean waves, sometimes fog horns, and sometimes crystal clear night skies to explore through telescopes with some of our professional astronomers (IRAS's first president was astronomer Harlow Shapley). There are opportunities for swimming, rowing, tennis, and ballroom dancing. And the Star Island Book Store and Gift Shop offer books related to the conference theme and other items to remember the week on the island.

Then there are the people who come to IRAS conferences--more than 200, from a variety of academic and professional fields as well as many well-educated "lay persons." Many belong to IRAS, which has about 300 members. Others come because they are interested in how liberal religion relates to science and in the particular topic. There is active dialogue in lectures, discussion groups, and late night "owl sessions"--and also in conversation on the porch overlooking the harbor, on the rocks, and at the social hour before dinner. For those interested, there are opportunities to meditate and worship together in the stone chapel on a high point of the island, at the gazebo, or in the reflective evening candlelight services.

Those who have been coming for a long time to IRAS conferences believe that the natural setting, the island history, and the people provide a unique opportunity for rigorous meaningful dialogue regarding religion and values in relation to contemporary science.

GENERAL CONFERENCE INFORMATION

The motif of an IRAS Star Island conference is discussion of significant questions on issues affecting human welfare in the light of religious and scientific knowledge. There will be active discussions among conferees, among speakers and conferees, and among speakers. Discussions take place in various settings: in large-group lecture sessions; in small workshop and seminar discussion groups; in informal conversations on the hotel porch and in the snack bar area and at various points throughout the island; in late night sessions; and in the conference newspaper, the *Star Beacon*.

The topic that will structure the motif this week was chosen because information gained from recent developments in the neurosciences speak directly to core questions of the welfare of our society. Not only is their potential for important advances in biomedical and psychiatric practice being realized, but they directly address perennial questions of humankind: What is the origin and fundamental nature of the human being? What forms human nature and what forms fulfilling human lives? Answers from the neurosciences concern our deepest human values and transform our understanding of ourselves. This conference will focus on topics that are central to both modern neuroscience and modern society. It will present current information and perspectives on them by recognized scientists, theologians, and humanists. The conference presumes that the best way for modern neuroscience to enlighten the most profound questions of what it means to be human is not to negate the goals, preconceptions and values held by society, but to integrate neuroscientific knowledge with the values of the time in which we must negotiate authentic lives.

Lecture presentations will be given in the morning plenary sessions (except for Duane Rumbaugh's lecture on Monday evening). An innovation this year is that the evening plenary sessions (and the Monday morning session at 11:15 a.m.) will be **interviews and discussions** with the lecturers conducted in a "talk show" format by Loyal Rue. The "Loyal Rue Talk Shows" will begin with biographical interviews and then move into audience participation.

The concurrent afternoon sessions offer a smorgasbord of intellectual and recreational activities.

The **IRAS seminar** will be held for the third year. Rather than reviewing a book, three reviewers will review different aspects of the pioneering work of Eugene d'Aquili, an anthropologist and psychiatrist, on religious phenomenology and mysticism. Gene has been coming to Star Island with his family for over 20 years and has been a frequent lecturer on the neurological mechanisms of religious experience.

The **workshops** from 1:30 - 2:45 pm will bring in music and literature: Charlotte Warren will lead a workshop on "Music and the Brain" and Robert Schiabe will lead a workshop on "Poetry and the Meanings of Mind." The workshops from 3 - 5 pm will present videos on topics related to the brain in the first half, followed by discussion led by co-facilitators in the second half.

"Free University" sessions provide conferees with an opportunity to present their ideas and discuss them with others. We expect that a number of conferees will, as in past years, volunteer to conduct these sessions, which will be announced in the *Star Beacon*. (For those planning to organize a free university session, please check with Nancy Anschuetz the day before for a space assignment and, after doing so, give a written note to Louise Williams, editor of the *Star Beacon*.)

Afternoons are also opportunities for recreation: talking, thinking, napping, reading, walking, and playing. You can visit the Marine Laboratory of the University of New Hampshire on Appledore Island on Monday afternoon. (Please sign up at the front desk in advance--the boat capacity is limited.) Various tours by the Star Island staff will be announced or posted. The hardy (or masochistic) can enjoy

a polar bear swim each morning. We will have the traditional lobster dinner on Wednesday (tickets *must* be purchased by Monday noon) and the traditional IRAS banquet on Friday. This year there will be a bonfire on the beach following a shortened version of the Loyal Rue show on Wednesday. The Pelican show (organized by the Pelicans, the young people who do all the hard work to make our stay on Star Island so delightful) will be on Thursday evening, and the IRAS talent show on Friday. If you would like to participate in the Talent Show, especially if you have talent (this is an optional requirement; all hams are welcome), Nancy Anschuetz will be happy to hear from you.

The *Star Beacon* is an IRAS tradition. This conference newspaper will appear at breakfast each morning and will give you up-to-date information on the conference and its participants. It will also provide an opportunity for you to publish poetry, commentary, and other forms of artistic expression--all at the discretion of the editor and as space is available.

Candlelight services allow time for quiet reflection and winding down at the close of each day. These have been arranged by Betty Lau.

Four **movies** with themes that concern the brain will be shown in Elliot following the candlelight service: *Awakenings* (Saturday), *Lorenzo's Oil* (Sunday), *Rain Man* (Monday), and *One Flew Over the Cuckoo's Nest* (Wednesday). The traditional owl sessions, which would be concurrent with the movies, have not been scheduled this year. Those who are still eager to engage in discussion following the candlelight service can meet informally in the dining area by the snack bar following the candlelight service, as in past years.

An informal **farewell party** will be held on Friday night. This will be an opportunity for final conversations with old and new friends in a pleasant, noisy setting before "packing up," and for using up any refreshing substances left over from the social hours.

If you have any questions or suggestions concerning the conference, please bring them up with Nancy Anschuetz, Leslie Lowry, or Barbara Whittaker-Johns.

Notes

The porch bell will be rung (a single stroke) five minutes before the beginning of the morning and evening sessions, at 9:55 a.m. and 7:25 p.m. We hope this advance warning will enable everyone to reach their seats in time to allow a prompt start at 10:00 a.m. in the morning and 7:30 p.m. in the evening.

A coffee/hot chocolate/bouillon break is scheduled for 10:55 - 11:15 a.m. each morning. When you hear the bell at the end of this break, please return quickly to the auditorium.

For those with children: children must participate in the children's program unless Nancy Anschuetz or Leslie Lowry receives a signed waiver.

Copies of manuscripts by lecturers with material covered by the lectures and the IRAS seminar will be on sale, at cost (of reproduction), in the lobby of the Oceanic.

LECTURE ABSTRACTS AND BIO-SKETCHES

SATURDAY EVENING KEYNOTE LECTURES

Ursula W. Goodenough, "Why Do We Need To Know About Our Brains?"

Religions have always been the constructs of human brains, whether one believes that these brains were recipients of divine revelation or particularly gifted in articulating the needs of humankind. Religions have also been the major source of what we would now call psychotherapy, providing guidance for emotional crises, havens for the mentally impaired, and comprehensive guidelines for the living of the good life. During the past few decades, enormous changes have occurred in our understanding of brain function and in the tools available for psychotherapy, changes that affect us and our families as well as the fundamental premises upon which our cultures and religions are based. It is no longer an option to remain uninformed about these matters, but it is a problem for many that their training has not included much of the relevant information or concepts. This IRAS conference has been carefully designed by its organizers to present the critical information and concepts in accessible contexts, and to reach both the well-trained and the initiates. What is very important is that regardless of our training, all of us are very much at the early stages in our ability to make decisions about how all this new information can and should impact our lives. Until we understand the information, however, our decisions will be at best naive. It has been my personal experience that my understanding of the biology of brain function has brought me deep resources for my understanding of myself, the human endeavor, and our spiritual possibilities. I very much look forward to sharing this adventure with the rest of you.

Ursula Goodenough is a professor of biology at Washington University in St. Louis, MO, and currently president of IRAS. She was educated at Radcliffe, Barnard and Columbia, and received her Ph. D. in cell biology from Harvard in 1969. She was on the faculty in Harvard's Biology Department for seven years before assuming her present academic position. She directs a laboratory that studies the evolution of sex in microorganisms, using the tools of molecular genetics and cell biology, and teaches cell biology to undergraduates. She is also active in promoting the federal funding of scientific research and was recently elected as president of the American Society of Cell Biology. She is married to fellow-scientist John Heuser and they have five children, Jason, Mathea, Jessica, Thomas and James. She first came to Star Island in 1987 and became active in the administration of IRAS in 1989. She has co-organized a Star Conference with Tom Gilbert, 3 IRAS-sponsored AAAS conferences (with Loyal Rue and Brian Swimme) and has published 3 papers on science-religion themes in *Zygon*. In her spare

time (!) she sings in a Presbyterian choir, goes out dancing in East St. Louis, and talks to her friends.

Barbara Whittaker-Johns, "Ten Miles Out -- Welcome to the Island Reflecting on the Brain"

As we spend a week together conversing on "Knowledge Most Worth Having in the Decade of the Brain," we will be ten miles out in more ways than one. "Ten miles out" refers, of course, to the location of Star Island and to where we will be this week, geographically speaking.

Ten Miles Out is also the title of a guide book to the Isles of Shoals written by the late Unitarian Universalist minister, Lyman Rutledge. (Lyman summered on Star Island much of his life and also was the author of *The Isles of Shoals in Lore and Legend* and a collection of his poems, *Earth Music*. He was the father of our well-known Island Registrar, Ed Rutledge.) In his guide book to the Isles of Shoals, Lyman quotes a Rev. Edgar Wiers who, in 1927, said. "No one who has been to Star Island is ever quite the same again."

"Ten miles out" suggests too, then, that being on Star Island for a week of talking together about the brain may invite us to help chart new scientific and religious understandings of the brain, consciousness, mind, and so forth. "Ten miles out" invites us to leave the mainland of our thinking and to wonder as we will.

Lyman Rutledge, in his poem, "The Universe is Calling" (Kittery Point, 1970) wondered --

"O little human brain wherein I dream immortal dreams,
And count the countless stars,
Tell me why among them all
Have I come to self-awareness
On the planet Earth alone?"

Each of us arrives at this time and place of ten miles out with our own ideas and with our own articulated and unarticulated wonderings about what knowledge of the brain is most worth having and why. May we spend this week voicing these ideas and wonderings with one another, and may we never be quite the same again.

Barbara Anne Whittaker-Johns is Minister of First Parish Unitarian Universalist Church of Arlington (MA). Previously, she served as Minister of the Unitarian Universalist Society of Amherst (MA) for six years.

Barbara worked in education and counseling from 1964 to 1980, earning a Master of Science degree in education from Yeshiva University. In 1984 she received a Master of Divinity degree from Harvard University. She grew up in Bangor, Maine, in the environs of Bangor Theological Seminary.

Barbara's involvement in IRAS began in 1984. She has served IRAS committees and Star conferences in various ways, was Chaplain in 1987 and 1993, and is in her

second term as Vice President for Long Range Conference Planning.

Her husband, Frank A. Toppa, also has been coming to the IRAS week since 1984. Their son, Isaac Anthony Toppa, became an IRAS Star Islander the summer of 1989, when he was three months old.

SUNDAY MORNING

Terrence Deacon, "Why a Brain Capable of Language Evolved Only Once"

If the complexity of language (e.g., grammar) accounted for the failure of other species to develop languages, then many other species should at least exhibit simple language-like symbolic systems with small vocabularies and a few simple rules of grammar. The absence of even one other simple symbolic system indicates that even simple forms of symbolic reference are either exceedingly difficult or perhaps counter-intuitive for other species to learn. Why? It follows that a cognitive process that is this anomalous in nature required some rather unusual modifications of the brain to make it easy for humans to master. This modification ought to be one of the most robust and obvious differences in our brains and the best clue to why symbolization is so difficult. In previous research I have demonstrated a suite of deviant neuroanatomical features in human brains and outlined the developmental processes responsible. The most robust and divergent feature to result is a greatly enlarged prefrontal cortex and the expansion of its projection fields. Prefrontal regions contribute a number of attentional-mnemonic supports to learning. I will show why these are absolutely critical to symbol learning, but play a less consistent and essential role in other forms of associative learning. Prefrontal hypertrophy in humans has guaranteed that we are predisposed to employ these learning strategies and have facility in "computing" learning problems that rely on them. The magnitude of human brain reorganization emphasizes the importance of this core feature of language to the evolution of human cognition, consciousness and culture.

Terrence Deacon received his BA from Fairhaven College and Western Washington University in 1976 where he wrote a senior thesis on the semiotic theory of the philosopher Charles Sander Peirce, a M.Ed. from Harvard Graduate School of Education in 1978 where he studied cognitive development and philosophy, and a Ph.D. in Biological Anthropology from Harvard University in 1984 where he wrote a thesis based on laboratory research tracing connections of the frontal lobes in the monkey brain that are homologous to Broca's language area in the human brain. He has been Assistant and Associate Professor at Harvard University and is currently Associate Professor of Biological Anthropology at Boston University. He is also a Research Fellow at McLean Hospital and Harvard Medical School. His research has focused on the mechanisms underlying processes of brain development

and evolution in mammals, which has particularly drawn him to questions concerning human brain evolution. His studies range from bird to whale brains and many species in between. His current research utilizes xenotransplantation (transplanting fetal neural tissue from one species to another) in an effort to understand the mechanisms that control axon growth and target specificity and how this contributes to species differences. It is also directed toward understanding basic cellular processes that might someday allow transplant-based reconstruction of large-scale neuronal circuitry in brain-damaged patients. Throughout his career he has also maintained his interest and study of the basic philosophical questions that lurk just beneath the surface of his neuroscience research.

Rodney Holmes, "Knowledge Most Worth Having in the Decade of the Brain"

Knowledge Most Worth Having in the Decade of the Brain is a title that must now be defended. The speakers assembled at this conference represent positions rooted in contemporary neuroscience that, when taken at their depth, transform our understanding of what it means to be human. Theology and the humanities agree that humans are distinctive in that they are fundamentally mindful. Modern science, because it is rooted in evolutionary theory, treats mind not as a distinctive entity but as an emergent property that is the dominant cognitive strategy of our species. For human beings, the whole is the background against which the particular foreground is measured: the ultimate is ontologically prior to the proximate. This paper offers a portrait of a neuroscientific answer to the metaphysical question, "What kinds of creatures are we that we conceive?"

Rodney Holmes is co-chair with Barbara Whittaker-Johns of this years IRAS conference. Born'n bred in Lubbock, Texas, he received his baccalaureate from Abilene Christian College, M.S. in Veterinary Physiology and Biomedical Engineering from Purdue University, then his Ph.D. in Physiology and Biophysics from the University of Oklahoma in 1984. That year was also his introduction to Star Island, where the IRAS conference was titled "Recent Discoveries in Neurobiology: Do They Matter for Religion, the Social Sciences and the Humanities?" He did post-doctoral fellowships in Calgary and Chicago on the neural control of respiration and cardiac function, and for seven years has been Senior Lecturer in the Biological Sciences Collegiate Division of the University of Chicago. His wife of 15 years, Charlene Sennett, is a radiologist. Six year old Robin and four year old Kyle no doubt will make your acquaintance this week.

SUNDAY EVENING

Duane M. Rumbaugh, "Language Comprehension in the Great Apes and Human Child Development: an Intellectual Continuum"

The 20th century will be noted for a wide variety of scientific and technological advancements, including powered flight, antibiotics, space travel and the breaking of the genetic code. It also should be noted as the century in which major psychological, as well as biological, continuities between animal and human have been defined. Charles Darwin (1859) was quite right when he anticipated continuity in mental processes, some of which provide for language. Though none will argue that any animal has the full capacity of humans for language, none should deny that at least some animals have very impressive competencies for language skills, including speech comprehension.

The finding that the language skills in the bonobo and the chimpanzee are likely more fully and efficiently developed as a result of early rearing than by formal training at a later age declares a continuity even stronger than that defined by the language acquisition potential of the ape. To clarify, because early rearing facilitates the emergence of language in ape as well as in child, a naturalness to the familiar course of language acquisition, whereby comprehension precedes production, is also corroborated. In turn, the continuity and the shared naturalness of language acquisition serve jointly to define an advanced and critical point of linkage between the genus, *Pan*, and our own--one worthy of contributing to the series of reconceptions of ourselves as anticipated by Ploog and Melnechuk (1971).

Duane M. Rumbaugh, Director of the Language Research Center of Georgia State University, was born on July 4, 1929, in Maynard, Iowa.

An early researcher into teaching chimpanzees human languages, Rumbaugh trained a chimp named Lana to communicate by touching geometric symbols on a computer-monitored keyboard. His continuing research with his wife and colleagues, Sue Savage-Rumbaugh, zeroed in on the problem of symbolic representation, concluding that chimps not only understand the meaning of symbols but also use them to pass information among themselves. The team currently is directing research with a pygmy chimp named Kanzi, who has learned to comprehend English words and short sentences without specific training.

A 1950 graduate of the University of Dubuque, Rumbaugh earned his master's degree from Kent State University (1951) and his doctorate in general-experimental psychology from the University of Colorado (1955). Since 1986 he has been a scientific consultant to the NASA Life Sciences Division Rhesus Project and for relevant research with the French and Russian Space Agencies.

He was named the first Alumni Distinguished Professor by Georgia State University in 1987 and also a distinguished alumnus by Kent State University in 1992 and by the University of Dubuque in 1993. He was the inaugural G. Stanley Hall Lecturer on comparative

psychology of the American Psychological Association in 1984 and served as president of its Division of Comparative and Physiological Psychology in 1988. Currently he is president-elect of the Southern Society for Philosophy and Psychology.

MONDAY MORNING

Lauren Adamson, "Language, Affect, and Culture in Early Childhood"

Language does not emerge *de novo* with the first word. Rather, its roots lie deep within the social interactions of infants and caregivers. In this paper, I argue that such interactions provide human beings with a fundamental education in a culture's ways of communicating. Thus, the typical developmental path toward language courses through dialogues of smiles and coos and episodes of shared play rituals. Further, I suggest that without this intimate education, language will not fully flourish. Developmental disabilities such as aphonia, autism, or severe mental retardation may inhibit a child's access to the emotional and cultural foundations of language. Alternative educations that are designed to provide such access may facilitate these children's movement toward language and may reveal essential aspects of human language.

Lauren B. Adamson, Professor of psychology at Georgia State University, has published widely in the area of early social and emotional development, including a book, *Communication Development during Infancy*, that should be hot off the press late this summer. She was educated at Swarthmore College and at the University of California, Berkeley, where she received her Ph.D. in developmental psychology. She was initially attracted to this field by its long tradition of grand theory, careful observation, and practical application. She has found it a most hospitable intellectual home, thanks in large measure to her interdisciplinary collaborators who help her enter the worlds of anthropology, clinical psychology, comparative psychology, pediatrics, and speech language pathology. Her scholarship has also been immeasurably enriched by parenting two sons with her historian and fellow-Swarthmore husband, Walter.

TUESDAY MORNING

William J. Freed, "Neural Transplantation in the Human Brain: Potential Applications to Disease."

The past, present and future uses of neural transplantation in neurodegenerative disease will be discussed. The prototype disorder for which neural transplantation has been studied is Parkinson's Disease, in which the principle goal is to replace dopaminergic inputs to striatal neurons. Tissues that have been used for transplantation include fetal brain tissue, adrenal medulla, and various cell lines. Limitations and mechanisms of action of these transplantation techniques will be discussed. Reasons that fetal brain tissue may be

superior to various alternatives, such as adrenal medulla from adult donors, will be considered. Neural transplantation is also being investigated for a number of additional applications, such as spinal cord injury, chronic pain, and Huntington's disease. The special circumstances and unique problems of some of these representative applications will be discussed. The final part of the talk will consider the future and, specifically, the development of cell lines that can be grown in tissue culture for use in transplantation. The technique of introducing genetic modifications into cells will be described. Two alternative approaches will be considered. These methods can be used to cause cells to make enzymes or growth factors, or alternatively, they can be used to interfere with the mechanisms which control cell growth, so that brain cells can be grown in tissue culture. Current and proposed applications of these technologies in neural transplantation will be described.

William J. Freed was interested in tinkering, and thus began his academic life by majoring in electrical engineering in college. He was disappointed to find that electrical engineering did not involve tinkering, but became interested in psychology while working at a large mental institution in the summers, first as a janitor and later as an aide. He consequently changed his major to psychology, and received a baccalaureate degree from Rutgers University in 1971. During his senior year he worked in the laboratory of Dr. Joseph Mendelson and, when Dr. Mendelson relocated to the University of Kansas in the summer of 1971, moved with him to attend graduate school in psychology. He worked with Dr. Mendelson on motivational mechanisms for an additional two years and received a master's degree in 1973. He then did his dissertation research in the laboratory of Dr. Elias K. Michaelis where he worked on neurotransmitter receptors, especially excitatory amino acid systems, and developed his current interests in neuroplasticity. After receiving his Ph.D. in 1977, he went to work in the Neuropsychiatry Branch of the National Institute of Mental Health Intramural Research Program at St. Elizabeths Hospital. He began working on neural transplantation in 1977, in collaboration with Drs. Mark Perlow and Richard Wyatt at the NIMH, Barry Hoffer at the University of Colorado, and Lars Olson and Ake Seiger at the Karolinska Institute in Stockholm, Sweden. Using a rat model of Parkinson's disease, he and his collaborators published the first studies which showed that fetal brain grafts could reverse the effects of brain injury. Later, in 1981, he published studies showing that adrenal medulla grafts could also be used to produce restitution of brain function in animals with lesions.

Mary B. Mahowald, "Biomedical Ethics and Determination of Personhood"

Bioethical debates often center on determination of personhood, which in turn is often associated with an understanding of human development and brain function.

Issues that hinge on that determination include the morality of abortion, fetal tissue grafts, euthanasia, and definitions of death. In this presentation we consider events in human development that may entail obligations regarding nurturing or treatment of one human being by others. Different definitions of personhood are correlated with these empirical events, and some are formally articulated in laws and statutes. Science and law are ethically relevant but inadequate to personal moral decisions about the beginning and end of life, to determination of competence for decision making, and to issues of personal identity. We will examine the implications of alternative definitions of personhood in each of these areas.

Mary B. Mahowald is a professor in the Department of Obstetrics and Gynecology and the College, and Assistant Director of the Center for Clinical Medical Ethics at the University of Chicago. Having taught in a regular philosophy department for 14 years, she moved to a medical school/hospital complex at Case Western Reserve University in 1982, initiating the development of a bioethics program at that institution. In 1990 she joined the faculty at the University of Chicago, where (among other things) she teaches physician-fellows who are preparing to develop or participate in medical ethics programs at other institutions. The clinical issues that she most often addresses in her teaching, writing, and clinical activities involve women and children. Her most recent book (*Women and Children: An Unequal Majority*, Oxford, 1992) provides a case-illustrated overview of her approach to these issues.

WEDNESDAY MORNING

Cyril D'Souza, "Schizophrenia: A Glimpse at It's Neurobiology and Effects"

Though the Schizophrenia Syndrome, which afflicts over 1% of the population, has long been recognized, it is only in the past few decades that we are beginning to understand this complex and devastating illness. Protean in its manifestation, it has resisted our efforts to define and conceptualize it. Several rich and diverse theories have attempted to explain the syndrome, but few have withstood the tests of time and scientific rigor. It is becoming increasingly apparent that schizophrenia is a biological illness that is profoundly influenced, like any other illness, by psychosocial factors. The search for the etiology of schizophrenia has followed several lines of investigation. While no single overarching biological formulation fully explains this syndrome, several important biological findings have been demonstrated with consistency. A discussion of important genetic, neurochemical, and neuroimaging findings pertaining to schizophrenia will be presented.

While the main focus of the presentation is to discuss the neurobiological perspectives of schizophrenia, a major effort will be to provide a glimpse of the clinical manifestations of the illness. I will hopefully accomplish

this with a video presentation of a patient describing his experience of this devastating illness.

Cyril Deepak D'Souza, M.D., is Director, Schizophrenia Research Clinic and Tardive Dyskinesia Clinic, West Haven Veterans Affairs Medical Center, Yale University School of Medicine. A native of India, he went to Medical School in India and then received his training in psychiatry at the psychoanalytically oriented program at State University of New York, Brooklyn, before transferring to Yale University where he completed a fellowship in psychopharmacology. He recently received a Young Investigator Award from the National Alliance for Research in Schizophrenia and Depression (NARSAD) and the Scottish Rite program for schizophrenia research. He is currently involved in several treatment studies, pharmacological studies investigating glutamate function in schizophrenia, and studies involving movement disorders associated with schizophrenia. He is currently co-author of the chapter: "Neurobiology of Schizophrenia" in the soon-to-be-released *Adolescent Dysfunctional Behaviors: Causes, Interventions, and Prevention* (Sage Publications).

Marya Schechtman, "The Story of the Mind: Psychological and Biological Explanations"

Recent developments in the scientific study of the mind are widely taken to threaten our commonsense view of persons and of psychological explanation. This is nowhere clearer than in the clinical context. Traditional talk therapy takes as a starting point that a person's psychological symptoms are to be explained in psychological terms--by providing a narrative which shows the behavior or affect in question to be the comprehensible result of the person's conscious or unconscious beliefs, values, desires, and character traits. Lately, however, this approach has been challenged by an increasing understanding of the physiological underpinnings of mental illness as well as widely hailed successes in their medical treatment. It is often believed that these developments show the real explanations for psychological symptoms to be biological. A version of this position has been popularly defended in the bestseller, *Listening to Prozac*, and can be found in a number of academic works as well. I shall argue that the conclusion that neuroscientific results support a purely biological account of human behavior is overly hasty and naive. The data usually called upon are neither exclusively biological nor exclusively psychological, but rely on complex psycho-physical interactions. Focus on this new form of explanation promises a fruitful approach to many of the most vexing concerns in the philosophy of psychology.

Marya Schechtman is Assistant Professor of Philosophy at the University of Illinois at Chicago. A Chicago native, she has an A.B. from the University of Chicago and a Ph.D. in philosophy from Harvard. Her major area of research is in the philosophy of mind and personal identity, with a particular interest in investigating the

interface between empirical and philosophical questions about mind and self.

THURSDAY MORNING

C. Don Keyes, "Crisis of Brain and Self"

Depression confronts us with human vulnerability as such; it shows us that all mental states are brain events and reveals the limits of our autonomy. The depressed person's struggle against meaninglessness is a microcosm of the human predicament in general. This problem demands a resolution which is consistent with scientific truth and also does not undermine the spiritual dimension of life. I present three levels of concepts and arguments: (1) **Science**: Long-standing evidence requires a monistic concept of mind/brain. But reductionism that eliminates reference to mental states is a philosophical theory. Recent evidence about genetic predisposition to mental conditions like depression underscores the fact that we are determined by our biological nature. But belief in total determinism, like eliminative reductionism, is a philosophical theory. Both theories are beyond science. (2) **Philosophy**: Valuers are valuable because they are capable of aesthetic, ethical, and religious experiences. Such mental states, the "spiritual dimension of life" (or 'soul'), are brain events. Their symbolic content bestows meaning. (3) **Theology**: Christian faith attributes ultimate importance to symbols of God's grace that point beyond self and consequently do not depend on human autonomy. Fundamentalism misinterprets the nature of religious symbols by mistaking them for facts, but dialogue with neuroscience restores the symbolic, hence redemptive, character of religious symbols. Affirming such symbols in spite of meaningless is an heroic and meaningful act.

C. Don Keyes grew up across the street from East Central State University in Ada, Oklahoma. His father, a generation older than his mother, had practiced medicine in Indian territory during the Second World War. After he retired, he tried to teach Don biology before kindergarten. The most memorable lesson was learning that the brain produces consciousness. Don went on to school on the local university campus, but studied Plato and the Bible on his own. He also read scientific books about the brain, desperately trying to figure out how it produces consciousness. At 17 years of age, he went to the University of Oklahoma (B.A. in Letters, Phi Beta Kappa) to study classics and continental European philosophy with Gustav Mueller. His other degrees are from the University of Toronto (M.A.), Duquesne University (Ph.D.), Seabury-Western Theological Seminary (B.D. summa cum laude, S.T.M.), and Trinity College in the University of Toronto (Th.D.). Formerly Assistant Professor of Theology at the General Theological Seminary of the Episcopal Church in New York, he is now Professor of Philosophy at Duquesne University in Pittsburgh. He is the author of four books, including a recent work on biomedical ethics, *New Harvest: Transplanting Body Parts and Reaping the*

Benefits (Clifton, NJ, Humana, 1991). Works in progress include a book about his life-long struggle with the brain/mind relation called *Brain Mystique Light and Dark*. He has made numerous trips to Western Europe and sometimes lectures at the Chautauqua Institution.

David Olds, "From Affect to Personality: Psychiatry at the Interface"

The "affect disorder" is a malady which has had an extraordinary career. You might say it is expansionist. Once we had the major organic disorders and schizophrenia at one end and the neuroses and personality disorders at the other, with affect disorders (depression and manic-depressive disorder) in a modest place in the middle. In recent years we have seen some of what we called schizophrenia, and much of what we called neurosis, taken over by the affective spectrum. This has had a dramatic effect on the practice of psychiatry, mainly because the affect disorders appear to be treatable more and more effectively with medications. It has also told us some things about personality and the brain, as well as the importance and functions of affects in general. I will give a basic outline of the current view of affect disorders, as diagnostic entities, with theories about their causation. I will then try to show how the changes in our thinking about affect disorder, as well as the advances in pharmacological treatment, have changed our view of personality.

David Olds is Associate Clinical Professor of Psychiatry at Columbia College of Physicians and Surgeons and Training Specialist at the Columbia Psychoanalytic Center. He began life on an island somewhat bigger than Star in Newfoundland, then got educated at Yale and Columbia. He is now in practice in New York as a psychiatrist/psychoanalyst, crossing the mind-brain barrier with drugs and words and laboring under the impression that molecules are semiotic entities. He teaches courses for psychiatrists in semiotics, evolutionary biology, and cognitive sciences. His articles include, "Brain-centered Psychology: A Semiotic Approach," "Consciousness: a Brain-centered Informational Approach," and "Connectionism and Psychoanalysis."

THURSDAY EVENING

Larry Greenfield, "God's Brain and Ours: A Challenge for Theology"

In theology and religious devotion, we typically refer to the "mind of God" to speak of the divine knowledge and will. But hardly ever do we think and talk about "God's brain." This is consistent with the intellectual and devotional traditions that understand God as supernatural, transcendent, and spiritual. And so long as it was possible to divide--philosophically, theologically, and practically--human beings into mind and/or spirit over against body, and associate only the mind and/or spirit with the divine reality, a brainless God was entirely conceivable. But if it is increasingly difficult to keep the

human mind independent of the human brain, then theologians and faithful people ought to entertain the need also to consider the possibility and implications of a God with not only a mind but a brain as well. This is the central challenge of the neurosciences to theology and religious life--not only of the traditional and orthodox kind, but also of the liberal and neo-orthodox type, which have doggedly relied on a spirit/nature split to avoid the challenges of the sciences generally. Any adequate response to this challenge must address not only the intellectual issues at stake but the matter of piety too: whether a God with a brain can be both believed and worshipped--with mind, soul, and heart.

Larry L. Greenfield spent the first 21 years of his life single and in South Dakota. Marriage to Barbara, who also spent her early years in the Dakotas, came three days before moving to Chicago to start a graduate program in theology at the University of Chicago Divinity School. The union of Larry and Barbara in the Windy City eventually brought Sarah and Jessica into the world, while Larry's alliance with the university led eventually to a ministerial degree (B.D.) and an M.A. and Ph.D.-- all under the influence of Bernard Meland. As a student, Larry managed the coffee shop in the bowels of Swift Hall; later he moved up one floor to be dean of students and faculty member of theology at the Divinity School. In 1980 the Greenfields moved to Rochester where Larry served as president of Colgate Rochester Divinity School/Baxley Hall/Crozer Theological Seminary for a decade. Then came a stint as an interim minister at the First Baptist Church in Ann Arbor. Returning to Chicago in the early '90s, the Greenfields again reside in Hyde Park, and Larry commutes to the Loop where he is vice president and coordinator of research at the Park Ridge Center for the Study of Health, Faith, and Ethics.

FRIDAY MORNING CLOSING COMMENTS

Ursula W. Goodenough and Barbara Whittaker-Johns. "The Return Trip -- Re-integrating Knowledge with the Values of our Day."

Ursula and Barbara will begin with a brief look-back at their initial thoughts on Saturday evening, commenting on them in the light of the talks and events of the week. Following their comments, everyone will be invited to enter a time of sharing reflections on the events of the week.

CHAPEL AND CANDLELIGHT SERVICES

Activities of the day begin right after breakfast each morning with chapel, from 9:00 to 9:45 a.m, conducted by our chaplain, Richard Allen. Scheduled activities of the day (except for late-night movies and the farewell party) end with a candlelight service. The theme for the morning chapel services and a bio-sketch of the chaplain, and the names of the candlelight service leaders and their topics, are given below.

CHAPEL SERVICES

The overall title of the morning devotions is "A Doctrine of Grace." A more complete title is "A Doctrine of Grace for a Scientific Age OR How Many Angels Can Dance on the Head of a Pin Whose Coefficient of Friction is 0.164." Each morning will be a step in such a doctrine. The homilies will not be as impudent as the extended title might suggest--not quite. The possibility of Grace is a fine point of theology for our age. It comes to whether there is more to the world than we can see before us. Experience is the basis of understanding in our age, so we look to experience for signs of something "out there" that may be of help to us now and then.

Richard Allen, our chaplain, has just retired from the Unitarian Universalist parish ministry in Oklahoma City. He started his career as an engineer, and for his first fifteen years of work was immersed in technology. He has been plant engineer in a brick yard and an application engineer for a computer company seeking to control factories. Leaving that after fifteen years, he was a graduate student for eight years. His doctoral dissertation was a study of the anxieties in our culture from modern technology. He has been influenced in his thinking by William Blake (whom he understands only barely), William James (whom he understands pretty well) and Ludwig Wittgenstein (Allen understands some people who understand Wittgenstein). A perception of Grace and an outline of the manner we humans go about understanding anything are two questions that he has pondered and finds connected.

CANDLELIGHT SERVICES

- Saturday, July 30: **Tom and Paula Fangman**, "Return"
- Sunday, July 31: **Marjorie Ann Young**, "Joy of Silence"
- Monday, August 1: **Frank Toppa**, "If I Only Had a Brain"
- Tuesday, August 2: **Bill and Carol Orme-Johnson**, "One Hand Clapping"
- Wednesday, August 3: **Charlotte Brewer**, "The Courage To Be Spiritual"
- Thursday, August 4: **Joan Goodwin**, "Meet Sarah Alden Ripley, 19th Century IRASIAN"
- Friday, August 5: **Ray Harris**, "The Search for Serenity"

IRAS SEMINAR

Eugene d'Aquili is an anthropologist and psychiatrist who has done pioneering research in religious phenomenology and mystical experiences using an approach called "Biogenetic Structuralism." The IRAS seminar this year will be a review of d'Aquili's work from three different perspectives. The perspectives and reviewers are as follows:

Sunday: Philosophy of the Mind, by **Loyal Rue**, Professor of Religion and Philosophy, Luther College.

Monday: Mysticism, by **Ronald G. Murphy, SJ**, Professor of German Language and Literature, Georgetown University.

Tuesday: Anthropology of the Mind, by **William Irons**, Professor of Anthropology, Northwestern University.

The year 1974 marked the publication of *Biogenetic Structuralism* by Charles Laughlin, Jr., and Eugene G. d'Aquili. This work was the first presentation of the tenets of biogenetic structuralism to a skeptical and often hostile audience of social scientists. Although Waddington's review of *Biogenetic Structuralism* (along with Wilson's *Sociobiology*) in the *New York Review of Books* was excellent, many social scientists regarded it as a serious neurobiological intrusion into the social sciences and especially into culture theory. Biogenetic structuralism sees the brain and central nervous system as the primary locus of interactions of genetic constraints and environmental input. Among other things, it attempts to understand "universal" cultural institutions (of which religious phenomena are but one example) in terms of the evolution of the central nervous system.

By the time d'Aquili and Laughlin published *The Spectrum of Ritual* in 1979 there was considerably more acceptance for the approach taken in *Biogenetic Structuralism*. In February 1991 d'Aquili was invited to Rome for a week-long series of meetings and symposia organized around his work and that of his colleagues. Biogenetic structuralism was subjected to serious scrutiny by a group of Italian and German social scientists, philosophers, and neuroscientists as a possible "program for the social sciences for the 21st century." At a meeting of the European Institute for the Advanced Study of the Social Sciences held at Rocca di Papa, the Italian sociologist Carlo Quaranta acknowledged the contributions of biogenetic structuralism to traditional anthropology, philosophy of science, and theory of religion. However, he called for an extension of the theory to sociology and to sociological issues of large urban populations. Partially as a result of this meeting,

Charles Laughlin, John McManus, and other colleagues are currently expanding biogenetic structuralism into these new areas. D'Aquili, however, along with his research associate Dr. Andrew Newberg, has opted to continue work on religious phenomenology in general and on mystical experiences in particular. D'Aquili and Newberg have enlisted the aid of the nuclear medicine department at the University of Pennsylvania with the purpose of subjecting aspects of their neuropsychological models of religious experience to empirical testing using PET scanning and some of the newer techniques of MRI (upon accomplished meditators).

In addition to continued expansion in the area of religious phenomenology, d'Aquili and Newberg have become fascinated by the neuroepistemological issues implied by aspects of mystical experience. Neuroepistemology opens up an essentially new world to traditional philosophy. It is this world that has captured d'Aquili's interest and which he is currently eager to explore.

Eugene d'Aquili was born in Trenton, NJ, on June 4, 1940. After attending parochial schools in Trenton he was accepted by Villanova University into an honors program with a dual major in both philosophy and science. He graduated from Villanova in 1962 and then attended the University of Pennsylvania Medical School. During his four years at medical school he was awarded the position of Research Trainee at the Institute of Neurological Sciences. In 1966 he received his MD. from the University of Pennsylvania, having been awarded the Priestly Prize for Original Scientific Research. After doing an internship and a two year stint in the navy, d'Aquili returned to Penn where he began a four year residency in Psychiatry at the Hospital of the University of Pennsylvania. Toward the end of his residency he began graduate studies in anthropology at Penn. He received an MA in anthropology in 1979 and a PhD in 1989. After holding several full time academic positions in the Medical School, d'Aquili decided to divide his time between private practice and research. Since 1979 he has been a Clinical Associate Professor of Psychiatry at the University of Pennsylvania.

In the early '70s d'Aquili and Charles Laughlin developed biogenetic structuralism as an approach to cultural theory based on animal ethology and evolutionary biology, particularly on the evolution of the central nervous system. D'Aquili is author or co-author of five books and numerous papers expanding biogenetic structuralism into the areas of philosophy of

science, religious phenomenology, and neuroepistemology.

In 1974 d'Aquili was invited to give his first formal talk at an IRAS conference on Star Island. Since that time he has become involved in the work both of IRAS and CASIRAS (Center for the Advanced Study of Religion and Science). Over the years he has been invited to give six formal talks at the Star Island Conferences. He has served on the Editorial Advisory Board of *Zygon* and has contributed a number of original articles to the journal. In 1987 he was given the Academic Fellow Award by IRAS in recognition of his work relating religion and science through his studies of the neuropsychology of myth, ritual, and altered phases of consciousness.

He and his wife, Mary Lou, along with their two daughters Julie and Ellie (now adults), have been coming to the Star Island IRAS conferences since 1974.

REVIEWER BIO-SKETCHES

Loyal Rue first learned about Star Island from George Riggan, a professor of his and long time IRAS member. That was in 1971, but his first visit to the island came 16 years later. In addition to Star Island conferences, Loyal has participated in three very successful (standing-room only) IRAS-sponsored symposia for the AAAS as a co-organizer and/or speaker and is in his second term on the IRAS council. He has many journal articles and two major scholarly books to his credit (*Amythia: Crisis in the Natural History of Western Culture*, University of Alabama Press, Tuscaloosa, 1989 and *By the Grace of Guile: The Role of Deception in Natural History and Human Affairs*, Oxford University Press, New York, 1994). The manuscript of *By the Grace of Guile* was reviewed in the 1993 IRAS seminar. Rue is currently professor of religion and philosophy at Luther College in Decorah, Iowa, where he lives with his wife and three children. He has been called upon in past years to be a panel moderator and to summarize the kaleidoscopic collection of information imparted to us during a week at a IRAS Star Island conference. His outstanding performance and scholarly credentials led to the invitation to be a seminar reviewer and also "talk show host" for the 1994 IRAS conference.

Fr. G. Ronald Murphy, SJ, is Professor of German, Georgetown University, where he teaches German language and literature. He received his AB in Philosophy and Letters (1960), MS in German (1962), and PhL (Licentiate in Philosophy - 1963) from St. Louis University, and an MDiv from Woodstock College (1969) and PhD in Germanic Languages and Literature (1974) from Harvard University. Ordained in 1969, he has served as a Rector, Chaplain, and Assistant Director of a Jesuit boys home in addition to his faculty positions. Beyond organizing and teaching a number of courses and publishing journal articles that cover a

broad area of scholarship, he has three books to his credit (*Brecht and the Bible*, University of North Carolina Press, Chapel Hill, 1979; *The Saxon Savior: The Germanic Transformation of the Gospel in the Ninth Century Heliand*, Oxford University Press, New York 1989; and a translation of and commentary on *The Heliand: The Saxon Gospel*, Oxford University Press, New York 1992), and has received a number of prizes for his lecturing and research.

Fr. Murphy's review of d'Aquili's work on Monday will draw on his broad knowledge of the history of mysticism and focus on PRAYER AND THE MYSTICAL STATE OF DOING. It will be a response that covers Semitic and Indo-European attitudes toward secondary causality and the world. Three texts will be considered:

- a) The Franciscan tradition as found in the Prayer of St. Francis and the Canticles of the Creatures;
- b) The Jesuit tradition as found in the principle and foundation of the Spiritual Exercises and the Contemplation for Attaining Divine Love;
- c) The origin of these traditions with their confluence of Semitic and Indo-European spirituality as found in the ninth-century *Heliand*. Two texts will be considered: The Lord's Prayer, and the creation account -- the world as "light," as "beautiful" with the "comings and goings of people."

William Irons grew up in Port Huron, Michigan, a small town on the Canadian border. He received his BA from the University of Michigan in 1960, was a research student at the London School of Economics, 1964-5, and received his PhD in anthropology from the University of Michigan in 1969. He held faculty positions at Johns Hopkins University and Pennsylvania State University before joining the Northwestern University faculty in 1978 where he is professor of anthropology. His vita contains a long list of academic honors, research grants, and publications. He has done extensive field research in Iran on the ethnography, social organization, descriptive ecology, and history of the Yomut Turkmen nomads of Iran, making three trips to Iran and spending a total of four years in that country. As a result of this experience, he speaks both Persian and Turkmen. He has also done field research in Afghanistan and Venezuela. His work in these areas has led him into research on broader questions of biocultural evolution and the origins of morality. Starting in 1975, his research has focused on the use of evolutionary theory to understand human nature. In 1994 he was elected to the Council of the Human Behavior and Evolution Society. He is married and has two daughters. He and his family are all active in the Unitarian Church of Evanston.

WORKSHOPS

There are three scheduled workshop series. Two are scheduled for 1:30 to 2:45 pm, concurrent with the IRAS seminar; the third is scheduled for 3 to 5 pm. In addition to the scheduled workshops, there will be "free university" sessions led by conferees who volunteer after we arrive on the island. Free university sessions, which can cover any topic that a conferee would like to present and discuss with other conferees, will be announced in the *Star Beacon*. (See "General Conference Information" in this pamphlet for instructions for scheduling Free University sessions.)

Sunday, Monday, and Tuesday, 1:30 - 2:45 pm

MUSIC AND THE BRAIN

Participants will explore, through discussion and recordings, questions such as: What is music? Is music a symbolic language?

Workshop leader **Charlotte Warren**, in her doctoral work at Columbia Pacific University and in her teaching, has focused upon a holistic approach to music instruction and performance -- more specifically on the effects of the brain on the production of music and the effects of music on the brain. She has been teaching piano to preschoolers and adults for the past 18 years. Her home is in New York state where, in Rockland County and Orange County Community Colleges and in continuing education programs, she teaches such courses as Rhythmic Training, Piano Performance, and Music and Stress Management.

Wednesday and Friday, 1:30 - 2:45 pm

POETRY AND THE MEANINGS OF MIND

Neuroscientists are increasingly probing the brain to unravel its myriad complexities, and IRAS convenes this year to ask how neuroscience can help us understand what it means to be human. Poets, of course, have long been fascinated by the force and meaning of consciousness and mind, which somehow arise from the roughly three-pound materiality of brain. From William Shakespeare to Wallace Stevens, from Emily Dickinson to Rita Dove, poets have pondered the workings of the human mind. They have studied the subtleties of innumerable moods and explored the capacity of brain/mind, via words and imagination, to make meaning, as well as to transform and even create reality. Far from rejecting science, contemporary poets often see its work as fresh raw material for feeding the poetic imagination. This workshop is offered, not in opposition to neuroscience, but in a spirit of collaboration. By studying the poets, the neuroscientist (as well as her/his readers) can develop a clearer idea of those complexities, which any complete theory of brain/mind must take into account if it is indeed to be complete.

Workshop leader **Bob Schaible** is an Associate Professor of Arts and Humanities at Lewiston-Auburn College of the University of Southern Maine. In accordance with the mission of the college, his teaching and scholarship are primarily interdisciplinary. In collaboration with faculty from various fields, he teaches such courses as "Metaphor in Science and Literature," "Life and Literature after Darwin," and "Photography and Poetry: Two Ways of Speaking." He has presented papers at a number of national conferences on interdisciplinary studies and on the relationship between postmodern literary theories, pedagogy, and the political correctness debate. For the past four summers Bob has taught in New Hampshire's Scientist as Humanist Project, a seminar for high school teachers funded by NEH and NSF. He is attending the conference with his wife, Sally Bowden-Schaible, a practicing psychotherapist in southern Maine.

Sunday through Thursday, 3 - 5 pm

PROBING THE MYSTERIES OF THE BRAIN

In each session of this workshop series the first hour will be a showing of a video on a particular topic concerning the brain. This will be followed by an hour of discussion led by co-facilitators. The videos will be shown in Elliot Hall.

The video on Sunday will be "Mysteries of the Mind," a *National Geographic* special. **Sharon Stein** and **Neil Wollman** will be the facilitators. In addition to presenting information on basic brain functions, the video focuses on the potentialities of the brain/mind. Topics covered include hypnosis, biofeedback, acupuncture, and other more "mundane" human endeavors.

The video on Monday will be a showing of various clips from the Public Broadcasting Service series "Brain and Mind" **Gene d'Aquili** and **Nancy Anshuetz** will be the facilitators. Topics covered include some of the highest levels of everyday human functioning, including thinking, learning, memory, and language.

The video on Tuesday will be "Brain transplants" produced by Nova. **Mary Mahowald** and **William Freed** will be the facilitators. This will be a continuation of the topics covered in the morning lecture.

The video on Wednesday will be from the provocative three-part series on the "Sexual Brain" produced by PBS. **Ursula Goodenough** and **Bill Orme-Johnson** will be the facilitators. The video series looks at biochemical/genetic links to sex differences.

The video on Thursday will be from the PBS series "Mind and Healing" hosted by Bill Moyers. **Marge Davis** and **Henry Everett** will be the facilitators. The video looks at the mind/body relationship and ways that our thoughts, feelings, and behaviors influence our health.

PEOPLE

1994 IRAS Star Island Conference Planning Committee

Rodney Holmes	Cochair
Barbara Whittaker-Johns	Cochair
Marjorie Davis	
Thomas Gilbert	
Philip Hefner	

Conference Facilitators

Announcements	David Burwasser
Book Table	Marjorie Young
Candlelight Coordinator	Betty Lau
Conference Coordinators	Nancy Anshuetz Leslie Lowry
Children's Program Staff	Ruth and Phil Brady Debra Pittman-Page Beth Strum
Choir Director	Frank Toppa
IRAS/ <i>Zygon</i> Reception	Nancy Anshuetz
Program Pamphlet	Tom Gilbert
Registrar	Bonnie Falla
Social Hour Coordinator	Sara Sturges
<i>Star Beacon</i> Editor	Louise Williams
<i>Star Beacon</i> Production Manager	Jane Bengtson

Most of the facilitators are recruited on the Island. A more complete list of facilitators will be prepared and distributed later, after we know who they are.

The successful functioning of the conference is utterly dependent on the facilitators. If you would like to become actively involved in the functioning of the conference and meet and work with new and old friends, the conference chairpersons and coordinators, choir director, and *Star Beacon* editor and production manager would like to hear from you.

IRAS Scholars

Mr. William Grassie
Ms. Kimberly Jo Hague
Rev. David A. Lawton
Dr. John A. Teske

Current IRAS Officers

Ursula Goodenough	President
Karl Peters	Vice President, Religion
Rodney Holmes	Vice President, Science
Kevin Sharpe	Vice President, Interdisciplinary Affairs
Barbara Whittaker-Johns	Vice President, Conferences
Thomas Gilbert	Vice President, Development
Paul Rasor	Secretary
Thomas Fangman	Treasurer
Paula Fangman	Membership Coordinator

Council Members

Nancy Anshuetz	Marge Davis*
William Falla	Thomas Fangman*
John Fryer	Thomas Gilbert*
Ursula Goodenough	Donald Harrington*
Philip Hefner*	Rodney Holmes
Leslie Kawamura	Elizabeth Lau
William Orme-Johnson	Karl Peters
Paul Rasor*	Loyal Rue
Sharon Stein	Karl Schmitz-Moormann
Kevin Sharpe	Ernest Simmons, Jr.
Sharon Stein	Barbara Whittaker-Johns*
Neil Wollman	

*Ex Officio

READING LIST

Background and General Reading

Mind and Brain: Readings from the Scientific American Magazine. Freeman, 1993

Mind, Brain and Behavior, by Floyd E. Bloom and Arlyn Lazerson. Freeman, 1988

Listening to Prozac, by Peter D. Kramer. Viking, 1993

Books by Speakers

Keyes, D. Don. 1991. *New Harvest: Transplanting Body Parts and Reaping the Benefits*, Clifton, N.J., Human Press.

Mahowald, Mary B. 1993 *Women and Children: An unequal majority*, New York, Oxford University Press.

Adamson, L. B. 1994. *Communication Development During Infancy*, Madison, WI, Brown & Benchmark.

Allen, Richard L. 1991. *Deeper into the Cave*

Krasnegor, N. A., D. M. Rumbaugh, R. L. Schiefelbusch, and M. Studdert-Kennedy (eds.). 1991. *Biological and Behavioral Determinants of Language Development*, Hillsdale, NJ., Lawrence Erlbaum

Savage-Rumbaugh, E. S., J. Murphy, R. A. Sevcik, K. E. Brakke, S. L. Williams, and D. M. Rumbaugh. 1993. *Monographs for the Society for Research in Child Development*, Serial No. 233, Vol 58, Nos. 3-4 *Language Comprehension in Ape and Child*.

Rue, Loyal. 1994. *By the Grace of Guile*, New York, Oxford University Press.

Laughlin, Charles D., John McManus, and Eugene G. d'Aquili. 1990. *Brain, Symbol, and Experience*. 2nd Edition, New York, Columbia University Press.

D'Aquili, Eugene G., and Hans Mol. 1989. *The Regulation of Physical and Mental States*, Lewiston, NY, Edwin Mellen Press. Volume 4 in the series: *Mellen Studies in Sociology*.

Articles by Speakers

Adamson, Lauren B. and Duncan McArthur. 1993. "Joint Attention, Affect, and Culture," in C. Moor and P. Dunham (eds.), *Joint Attention: Its Origins and Role in Development*, Hillsdale, IN, Erlbaum

Deacon, Terrence W. Unpublished. "Prefrontal Cortex and the High Cost of Symbolic--or--Why a Brain Capable of Language Evolved Only Once."

- Freed, William J. 1993. "Neural Transplantation: Prospects for Clinical Use," *Cell Transplantation*, Vol. 2, pp 13-31.
- Freed, William J. Unpublished. "Brain Tissue Transplantation as a Therapeutic Technique: Lessons from the Parkinsons' Disease Model."
- Olds, David D. "Brain-Centered Psychology: A semiotic Approach. *Psychoanalysis and Contemporary Thought*, Vol. 13, No. 3
- Olds, David D. "Consciousness: A Brain-Centered, Informational Approach," *Psychoanalytic Inquiry*, Vol. 12, No. 1, 1992
- Olds, David D. "Connectionism and Psychoanalysis," *Journal of the American Psychoanalytic Association*, Vol. 42, No. 2, 1993.
- Rumbaugh, Duane M., and E. Sue Savage-Rumbaugh, "Language in Comparative Perspective" To be published as a chapter in a book edited by N. Mackintosh, *ANIMAL LEARNING AND COGNITION*, "Thinking and Problem Solving." Academic Press, Inc., San Diego.

ACKNOWLEDGMENTS

We are grateful for the contributions from lecturers, who gave their time and talent with no remuneration other than minimal expense reimbursement, and for the work of chairpersons, workshop leaders, discussants, and facilitators who are also contributing their time and talent without remuneration. Some of the speakers and staff contributed part or all of the cost of their expenses. The Chicago Center for Religion and Science provided office resources and many hours of staff time to conference preparation. We thank as well the many others involved in planning and in carrying out the innumerable tasks that are necessary to make a successful conference.

BANQUET ACKNOWLEDGMENTS

Given at the closing banquet by
Conference Co-Chair Rodney Holmes

Thank you all for making this the best party of my life! Each of our speakers was brand new to IRAS and to Star Island. To a person they want to come back, and they all cited you as the reason. I want to voice special thanks to:

STAR ISLAND CORPORATION General Manager **Tony Coddling** who guided us through rough waters in ways that will solidify the long term health of IRAS, **Ed Rutledge** and their staff, who we all will thank with due fanfare later on, and **Kaitlin Hunter, Kristen Hill and Derek Armstrong** who seemed to consider it a favor to them every time I asked them to lug around platforms and chairs.

CONFERENCE COORDINATORS **Nancy Anschuetz** who, like a blood hound went lookin' fer trouble, and treed it before any of us ever knowed it was comin'.and **Leslie Lowry** who quietly and competently set the major structural elements for this conference.

CONFERENCE COMMITTEE MEMBERS **Marjorie Davis** and **Philip Hefner** whose wise and sensitive counsel put this conference on the right track in the beginning, and who stood at every switch point to keep it heading in the right direction, and **Tom Gilbert**, the man whose personal warmth and grace is a model for all young men to follow. Tom is the author of the "Orange Book," all letters, publicity and announcements, who put in weeks of constant work, and at least one "all-nighter" to ease our way.

The magic of this conference has been its ambiance. It was CONFERENCE CO-CHAIR **Barbara Whittaker-Johns'** sensitivity, her intuition of the human spirit, that guided us in hours of deliberation. She helped me to find the right kind of speaker for us, and she patiently pastored me through my frustrations, picked up the pieces, and put them in exactly the right mosaic to create the ambiance that has been the real mark of the conference.

And most especially **Richard Allen** who offered us his life and his words, to remind us that we came already with "the knowledge most worth having." In the decade of the brain, it is good to live justly, love mercy, and walk humbly with our God.

**Schedule for the 41st Annual IRAS Conference: "Knowledge Most Worth Having in the Decade of the Brain"
Saturday, July 30, through Friday, August 5, 1994**

PERIOD	ACTIVITY	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
		ORIENTATION	THE EVOLVED HUMAN BRAIN	LANGUAGE & EMOTION IN CHIMPS & CHILDREN	NEURAL TRANSPLANTS	SCHIZOPHRENIA	DEPRESSION	A SECOND LOOK
8:00-9:00 a	Breakfast							
9:00-9:45 a	Chapel		Richard Allen	Richard Allen	Richard Allen	Richard Allen	Richard Allen	Richard Allen
9:45-10:00 a	Free							
10:00-11:55 a	Lectures		Terrence Deacon	Lauren Adamson	William Freed	Cyril D'Souza	David Olds	Closing Session Goodenough Whittaker-Johns
10:55-11:15 a	Break							
11:15-12:15 p	Lectures		Rodney Holmes	Loyal Rue ¹	Mary Mahowald	Marya Schechtman	Don Keyes	
12:15-12:30 p	Free							Whale Watch 10:30 am to 2:30 pm
12:30-1:30 p	Lunch							
1:30-5:30 p	Concurrent Activities²	Star Island Orientation ³		Appledore Excursion ⁴			IRAS Annual Meeting ⁵	
1:30-2:45 p	IRAS Seminar Eugene d'Aquili ⁶		Philosophy of the Mind (Loyal Rue)	Mysticism and the Mind (Ronald Murphy SJ)	Anthropology of the Mind (William Irons)			
1:30-2:45 p	Workshops I		Music & the Brain Charlotte Warren	Music & the Brain Charlotte Warren	Music & the Brain Charlotte Warren	Poetry and the Meanings of Mind Robert Schiable		Poetry and the Meanings of Mind Robert Schiable
3:00-5:00 p	Workshops II⁷		Mysteries of the Mind (National Geographic)	Brain and Mind (PBS)	Brain Transplants (Nova)	Sexual Brain (PBS)	Mind and Healing (Bill Moyers)	
5:30-6:30 p	Social Hour					IRAS/Zygon Reception ⁸		
6:30-7:30 p	Dinner					Lobster Dinner ⁹		Banquet
7:30-9:30 p	Keynotes, Interviews, & Recreation	Ursula Goodenough Barbara Whittaker-Johns	Duane Rumbaugh	Loyal Rue ¹	Loyal Rue ¹ Bonfire on the Beach	Loyal Rue ¹	Larry Greenfield Pelican Show	Talent Show
9:30-9:45 p	Free							
9:45-10:15 p	Candlelight	Paula & Tom Fangman	Marjorie Ann Young	Frank Toppa	Carol & Bill Orme-Johnson	Charlotte Brewer	Joan Goodwin	Ray Harris
10:15 p - ?	Free (Movies)	Awakenings	Lorenzo's Oil	Rain Man		One Flew Over the Cuckoo's Nest		Farewell Party

¹Loyal Rue will interview: Adamson and Rumbaugh on Monday morning; Deacon, Adamson and Rumbaugh on Monday evening; Freed and Mahowald on Tuesday evening; and D'Souza, Schechtman, Olds, and Keyes on Wednesday evening. The Tuesday evening interview session will end shortly after sunset, at which time we will go to the beach for the bonfire.

²Afternoon activities are concurrent (except on Saturday and Thursday). Other activities, organized by conferees, will be announced on the Island.

³The Star Island Orientation, conducted by the Star Island staff, starts at 4 pm and is the one and only scheduled activity that is mandatory for all conferees.

⁴A visit to Appledore Island where a Marine Laboratory of the University of New Hampshire is located. The boat leaves at 2 pm and returns at 5 pm.

⁵The Annual IRAS Meeting will start at 2 pm and probably be over by 3 pm. It will be followed immediately by a meeting of the new IRAS Council, which may last until 5 pm. Council meetings are open; observers are welcome.

⁶The IRAS Seminar will be a review of the work of Eugene d'Aquili, an anthropologist and psychiatrist, on religious phenomenology and mystical experiences. Entries identify the aspects of d'Aquili's work that will be reviewed on each day, followed by the name of the reviewer.

⁷The first half of each of these workshops will be a showing of a video. The second half will be discussion led by knowledgeable co-facilitators.

⁸The IRAS/Zygon reception starts at 5 pm and merges into the social hour.

⁹There will be a lobster dinner on Wednesday. Tickets are \$5.50 per person and must be purchased by Monday noon. Lobster diners should be seated by 6:15 pm.