INTERNATIONAL CULTURAL FOUNDATION

Volume 2, No. 4 ICF Report DECEMBER, 1984

ICUS XIII Convenes in Washington, D.C.

The Thirteenth International Conference on the Unity of the Sciences, sponsored by the International Cultural Foundation, convened on September 3 at the J. W. Marriott Hotel in Washington, D.C. The conference was attended by 250 participants from 42 countries.

The most striking difference between this conference and its twelve predecessors was the absence of the founder of the International Cultural Foundation, the Reverend Sun Myung Moon, due to his imprisonment at the federal prison in Danbury, Connecticut.

This unusual and controversial circumstance was noted by Dr. Morton A. Kaplan, chairman of ICUS XII (1983) at the beginning of the ICUS XIII (1984) opening plenary session. In describing his recent visit with Reverend Moon in prison, Dr. Kaplan said: "It was as though I were visiting him in his home. . . . This was a serene man, interested in how the ICUS organization could be improved. . . . Meeting with this man, who thinks about what he can do and not about what has been done to him, was one of the most remarkable experiences I have ever had."

Mrs. Sun Myung Moon extended a welcome to the participants: "Because my husband is not able to be here, he asked me to express his deepest gratitude to you all for coming to participate in this year's meeting. Your presence here is a testimony to the seriousness and excellence of this conference. It also indicates the importance this meeting has for the academic community and the world as a whole."

She continued: "ICUS has always been very special to my husband. It is

continued on page 2

INTERNATIONAL JOURNAL ON WORLD PEACE

The *International Journal on World Peace* has made its debut. The new quarterly journal of the Professors World Peace Academy has as its editor Dr. Panos Bardis of the University of Toledo. "Although the *International Journal on World Peace* responds to the requests and wishes of the members of the PWPA," states PWPA International President Dr. Morton Kaplan, "it is aimed at a broader audience of specialists and nonspecialists. It is a scholarly, multidisciplinary, and cross-cultural publication dealing with all aspects of peace from both theoretical and practical perspectives. This quarterly journal includes four main departments: Articles, News, Miscellany, and Book Reviews." Each article is accompanied by at least one evaluative comment.

Articles in the first issue included: "On Fostering a Just Peace," by Rudolph J. Rummel; "To Fight Communism: Why

continued on page 3

PWPA Hosts Middle East Seminar

"Trade and Peace in the Middle East was the topic of an exciting Professors World Peace Academy (PWPA) seminar held in Pomezia, Italy on August 3-4, 1984. The forty participants included leading academics from fourteen countries, twelve of them in the Middle East. The countries represented were: Egypt, Jordan, Israel, Lebanon, Bahrain, Yemen, Sudan, Algeria, Morocco, Tunisia, Greece, Turkey, England, and the United States.

Professor Joseph Ben Dak of Israel set the stage for the discussions with a paper proposing a scenario in which trade ties could be used to build broader cooperation. Professor Abdul Aziz Asqqaf of Yemen gave a detailed presentation on trade relations of the Arabian Peninsula.

One participant wrote in response to the conference: "I would like once more to compliment you and your team for the work of organizing the conference, in the framework of which the participants on both sides of the political arena succeeded in creating a fruitful professional dialogue and establishing personal ties that perhaps may provide the basis for peace in this disrupted region."

Preparation for publishing the papers and summaries of the discussions is well under way. The book is expected to be available in 1985.

Eager to continue the dialogue, the participants have drawn up a proposal for a subsequent meeting to be held in Paris in February, 1985. The topic will be "The Middle East City: A Harmonious Environment for Modern Man."

ICUS XIII (1984)

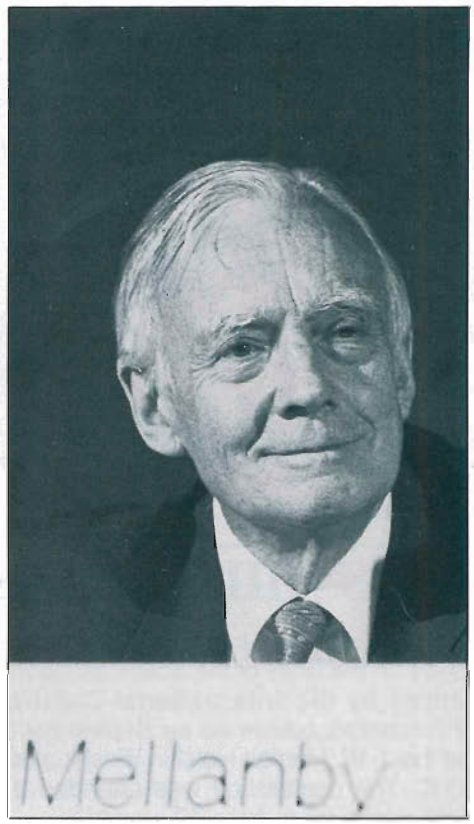
continued from page 1

a remarkable example of a project devoted to the building of the Kingdom of God on earth. Bringing together scholars from all parts of the world and from every academic discipline, it has the potential to address and solve the world's problems in ways that no other organization can do. . . . In this hour of tribulation for my husband, for my family, and for our movement, I thank you profoundly for your sympathy, love, support, and most of all, for your prayer. My husband joins with me in expressing our gratitude to you all." She then introduced their son, Hyo Jin, who delivered his father's traditional Founder's Address (See separate article on page 4.)

Dr. Kenneth Mellanby, Chairman of ICUS XIII (1984), welcomed participants, noting that over one-half were attending their first ICUS meeting. Dr. Alexander King, Vice-Chairman of ICUS XII, stressed the importance of these international meetings. King stated: "In a world drifting towards global chaos and dominated by technological development, with its possibilities for both good and evil, a world in which many people have lost faith in themselves and inner meaning, a meeting which stresses value, unity, and interaction is most important, particularly for the sciences."

Participants spent the next few days in committee presentations and discussions. A variety of papers, grouped into seven general topics, was presented. Topics ranged from "Reduction and Emergence in the Unified Theories of Physics," "Scientific Model Building: Principles, Methods, and History," and "The World System of Cities in Transformation" to "Educational Values and Hopes for Universal Basic Education in Africa," "Higher Education and Working Women in the United States and Japan." "Underwater Ocean Exploration," "Imaginary and Reality in Complex Relativity" and "Relation between Ethics and Religious Belief."

An innovation at ICUS XIII (1984) was the creation of two special Survey Committees to review the work of the seven working committees in light of how they contributed to the two central conference themes: "Unity of Science" and "Science and Values." Participants of the two committees monitored each working committee; summaries of the findings of the Survey Committees were presented along with summaries of the other seven committees at the closing plenary session.



PHOTOS COURTESY OF ICS

(Left) Mrs. Sun Myung Moon welcomes participants to ICUS XIII. (Right) Dr. Kenneth Mellanby, ICUS XIII Chairman. (Below) Dr. Claude Villee, plenary moderator, opens ICUS XIII on September 3.

Dr. Alvin Weinberg, Director for the Institute for Energy Analysis at Oak Ridge, Tennessee presented a plenary address, "Values in Science," Dr. Eugene Wigner, Emeritus professor at Princeton University, addressed a conference plenary session on September 4 on the topic: "Reflections on the Role and Purpose of Science."

The Conference concluded on Wednesday, September 5 with a summary session and farewell banquet. Highlighted in the banquet entertainment was pianist Lorin Hollander. Hollander performed three works by J.S. Bach, "whose music," according to the artist, "transcends the world we know," and selections by Sergei Prokofiev and Moussorgsky.

Colonel Bo Hi Pak, special assistant to Reverend Moon, delivered closing remarks in which he traced the history of Reverend Moon's mission in America, the facts surrounding the tax case resulting in Reverend Moon's imprisonment, and the consequent surge of support for Reverend Moon.

"Reverend Moon's case has shocked and awakened the conscience of Amer-

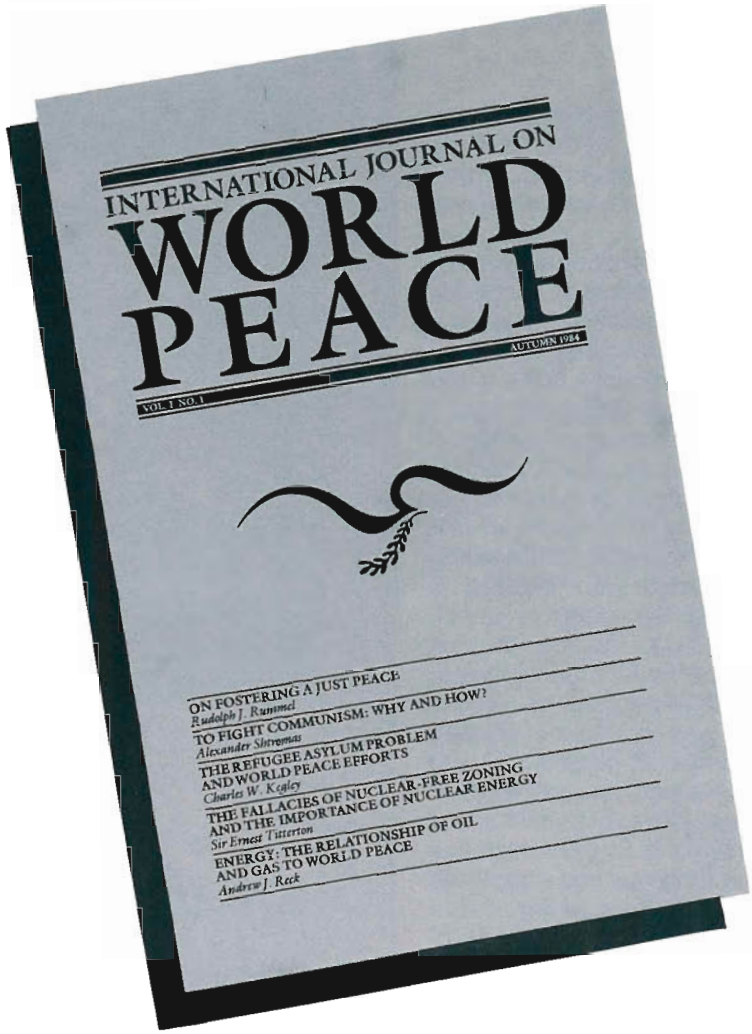
continued on page 3

PWPA Journal

continued from page 1

and How?" by Alexander Shtromas; "The Refugee Asylum Problem and World Peace Efforts," by Charles W. Kegley; "The Fallacies of Nuclear-Free Zoning and the Importance of Nuclear Energy," by Sir Ernest Titterton; and "Energy: The Relationship of Oil and Gas to World Peace" by Andrew J. Reck. The upcoming issue will contain: "A Sinister Freedom: Orwell's 1984 Reconsidered," by John David Frodsham; "Marxism, America, and the Challenge of Asian Capitalism," by Richard L. Rubenstein; and "For an Open Dialogue with South Africa by African Leaders," by G. Edward Njock.

"Although many valuable contributions to the understanding of the problems of world peace will come from PWPA members, with their diverse cultural and disciplinary backgrounds, the journal is open on an equal opportunity basis to any person, lay or academic, who has an important contribution to make," says Dr. Kaplan. "We welcome contributions regardless of nation, culture, sex, ethnicity, political persuasion, or any other characteristic that has served to distinguish one human from another. The cause of peace, and of human freedom, is too important to allow any preconception to block important thoughts on this subject."



ICUS XIII

continued from page 2

ica," Col. Pak said. "For the first time in American history, a united front of highly diverse religious people is fighting for the preservation of America's most valuable resource—religious freedom."

Mrs. Moon, who presided graciously at the banquet, thanked everyone present for his hard work at the conference, saying that many excellent papers had been presented and discussed.

"When my husband initiated ICUS thirteen years ago," she remarked, "I really did not have any idea about the value of this conference. However, now that it has reached the level of accomplishment we see today, I am astonished at the greatness of the ICUS meetings. In an age of specialization, we clearly see the need for a global meeting with this particular perspective."

ICUS XIV will be held in Houston, Texas, in November 1985.

Mrs. Moon greets ICUS XIII participants at the opening reception of the conference. On the left is her son Hyo Jin Moon and on the right is Col. Bo Hi Pak, assistant to Rev. Moon.

Founder's Address

Reverend Moon's Founder's Address to the Thirteenth ICUS, delivered in his absence by his son Hyo Jin Moon, was a major statement of his intentions and purposes for ICUS.

Reverend Moon identified two major goals for ICUS: The unification of science and the direction of science toward human values. Addressing the first theme of unity of science, he said: "One of the greatest tragedies now facing the pursuit of knowledge is the fragmentation of the academic disciplines. Such divisive specialization of science and knowledge, like the dismantling of a machine, ultimately paralyzes the function of the whole and prevents science from fulfilling its mission. Whether we accept it or not, the world is one. It is erroneous to think that one discipline has a more complete view of reality than another, or to think that discoveries and advances in different areas are unrelated. All fields of scientific and academic study are intertwined; each having a unique yet partial view of the whole or reality. It is to the advantage of total human progress and happiness that all fields of study harmoniously work together to form an integrated view of reality. But the view of unity of science and knowledge about which I speak does not mean simply reducing all knowledge to a single academic discipline. Instead, it is a unity grounded in a fundamental purpose. In science there are many fields, but each aims at the realization of human happiness."

He then asserted that scientists and academicians have a role and a responsibility in the world-wide struggle to overcome misery, suffering, and war. This responsibility, he said, can be met only if the divisiveness within the scientific world is overcome and if "value-free" science is replaced by science directed clearly toward the value inherent in human life oriented toward God.

Continuing a theme he began last year, Reverend Moon said that both democratic capitalism and communistic socialism have failed to solve world problems. He attributed this failure to a shared loss of the transcendent and the reduction of human life to its materialistic components.

While affirming absolute and God-centered values, he also said that past standards of value have proven inadequate and that "new reasonable morals" must be derived from a "transcendent, unified system of thought."

(Left) Hyo Jin Moon, eldest son of Rev. Sun Myung Moon, delivers the ICF Founder's Address in the absence of his father. (Below) Mrs. Sun Myung Moon.

Reverend Moon concluded his address by saying that he believes that unification thought can be the foundation for such a unified value system. He called upon scientists and scholars present to seek to find ways of unifying scientific thought around a transcendent value system. "My ardent wish," he said, "is that all scientists and scholars develop their respective fields on the basis of a solid view of moral values, thus exalting human dignity by adopting a spiritual and unified method as well as a materialistic and analytical one. Solutions to the world's problems can only come about through this wholistic approach to human existence. Rather than the clash of fragmented approaches and ideals, a harmonious effort centered on collective wisdom and knowledge is required of the many distinguished scholars gathered at this conference."

Joseph Bettis

ICUS XIII Committee Proceedings

The following article summarizes the proceedings of the nine conference committees based on reports by the committee chairpersons at the closing plenary session.

Committee I
UNITY OF THE SCIENCES
Gerard Radnitsky, organizing chairman.

In this committee, science was taken in its wide sense, including the social sciences and history. There is a unity of method of solving problems with respect to science as an activity, stated the chairmen. The global method of solving problems is the same in all disciplines.

The work of the committee focused on the question of reduction: whether it is possible to derive a theory about entities at a particular ontological level from theories about entities on a different ontological level. The general idea of reducing or deriving one theory from another covers both upward causation and downward causation.

While discussing these issues, special attention was paid to ongoing controversies surrounding the reduction of chemistry to quantum mechanics, the problems of emergence, the relations between body and mind, and attempts to explain social phenomena in psychological and sociological terms.

"Specialization is necessary," Radnitsky commented, "but it should be accomplished by searching for fruitful interactions between disciplines. This may result in new disciplines—molecular biology, for example."

Committee II
THEORETICAL EMPIRICISM: A GENERAL RATIONALE FOR SCIENTIFIC MODEL-BUILDING
Herman Wold, organizing chairman.

Human knowledge as established by scientific model-building is a synthesis of theoretical knowledge and empirical knowledge. Scientific models are built in three states: model specification, model estimation, and model evaluation, which measures the matching between theory and empirical knowledge. The scientific community evinces such consensus on these three stages but has many controversies as well. The unity of the sciences can be seen as the least common denominator of the three stages, the chairman observed.

In developing the rationale of scientific model-building, the committee focused on path models with manifest or latent variables and on their estimation by "Fix-Point" and "Partial Least Squares" methods. Several controversies were discussed, including prediction accuracy vs. parameter accuracy. Model-building in such diverse fields as education, economics, physiology, and allotment of scientific resources was discussed.

"Human knowledge is a loosely-knit network of scientific models. Around each model and its active research frontier, there is a gray zone where human knowledge is enriched and science inspired by quasi-scientific approaches—often interdisciplinary, often tentative or speculative. Philosophy and the arts are indispensable agents in this gray zone," Wold noted.

Committee III
HUMAN BEINGS AND THE URBAN ENVIRONMENT: THE FUTURE METROPOLIS
Ervin Y. Galantay, organizing chairman.

The large metropolis is a recent historical phenomenon, the committee noted. In 1900 only four cities had more than two million inhabitants. By the year 2000, there will be at least 60 metropolitan agglomerations with populations exceeding five million people and a combined urban population of 650 million. Numerous two-million-plus cities are emerging in less-developed countries. There is a concern that cities of this size may become unmanageable.

Members of the committee—sociologists, urban planners, architects and engineers from five continents—were interested not only in describing the phenomenon of urban growth but also in trying to control the transitions and changes. Urban planning has been far too concerned with static images and equilibrium states, they found. Future studies need to concern themselves with disequilibrium and transition stages.

The committee declined to work solely within a framework of "disaster" scenarios but tried, instead, to work with a framework of hope, taking into account the elasticity of systems and the ingenuity of the human mind to adapt to new situations.

It was noted that a few metropolitan cities have adopted regional plans with positive policies, including restriction by decongestion, decreasing the inner cities' population and increasing surrounding greenbelts to prevent urban sprawl. London, Moscow, and Stockholm were cited as examples.

Although a comprehensive plan of action for all urban developments is not possible to draw up at a conference, it was noted that all environmental and land use problems should be considered within a global ecological perspective.

The future metropolitan city should be based on an in-depth study of functional necessity and should form part of a network in which administrative, cultural, industrial, and commercial functions are fairly distributed, the committee concluded. It should be integrated with the surrounding agricultural areas so that both urban and agricultural parts consider themselves equally important, and it should be human in scale and helpful to its less fortunate residents.

This is a formidable task, the committee concluded, but one which should engender the cooperation of inhabitants and planners alike.

Committee IV
CRISES IN EDUCATION IN THE 1980'S; A SURVEY OF EDUCATIONAL VALUES AND SYSTEMS
Nobuyuki Fukuda, organizing chairman.

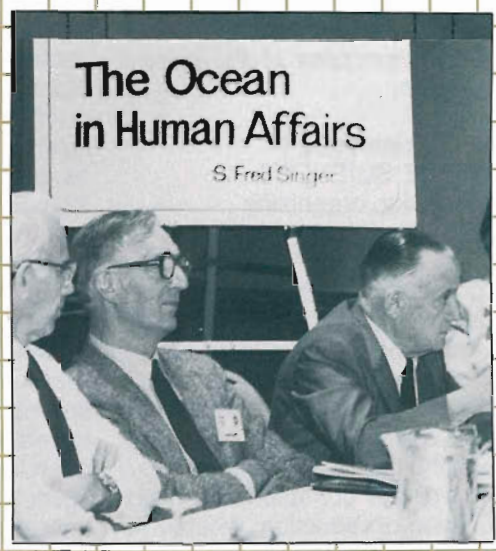
The broad representation of educational experts in the committee made possible a general survey of the problems in education around the world. The committee stated: "The mere examination and comparison of existing systems is inadequate at this time. A thorough reassessment of fundamental issues recognized to be common to most countries, such as the over-emphasis on intellectual subjects, the lack of value education, or the weakening of family education is being called for."

The educational system in any country is deeply rooted in history and culture, the committee observed. Without a background in a country's particular heritage, it is sometimes difficult to understand its system of education. Education in Japan was discussed in depth. Education in developing countries in Asia and Africa received attention, as did education in the Soviet Union and China.

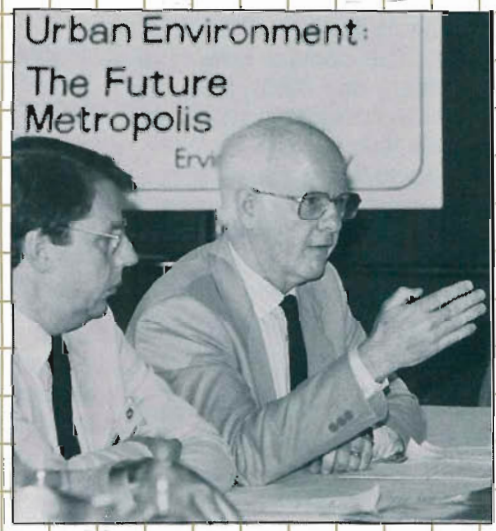
The final session of the committee dealt with issues of international exchange and cooperation.

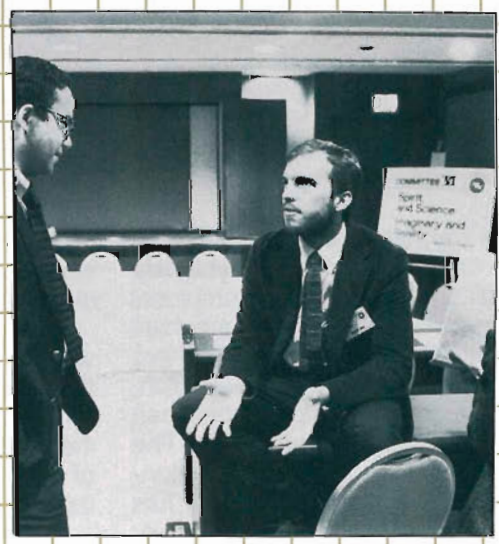
continued on page 8

ICUS XIII: Washington, D.C.



(Above) J.W. Marriott Hotel in Washington, D.C., site of ICUS XIII. (Below) Pianist Lorin Hollander performs at the farewell banquet. (Right) Committees V, III and VI in session, discussing, respectively, the ocean, the future metropolis, and spirit and science.





September 3-5, 1984

(Left) ICF President Neil Salonen, above, and Dr. Ervin Galantay, Chairman of Committee III, at the closing plenary session. (Above) Informal discussion was a major benefit of ICUS participation.

Committee Summaries continued from page 5

Committee V

THE OCEAN IN HUMAN AFFAIRS
S. Fred Singer, organizing chairman.

Dr. Athelstan Spilhaus, honorary committee chairman, presented the summary. The planet Earth is alone in the solar system in possessing a water ocean and living things. The existence of this ocean may be responsible for the evolution of life and humankind, Dr. Spilhaus began. Throughout the history of the planet, the ocean has determined the Earth's climate. The ocean has assumed increasing economic importance as a source of food and minerals. It also provides a frontier of scientific and technological exploration. Its importance in human affairs has led to increased international attention to the management of the ocean and its resources.

The committee covered topics dealing with the history and evolution of Earth and ocean; ocean-atmosphere interaction; ocean research and technology; and the ocean in human commerce—covering a time span, Spilhaus noted, of 4.6 billion years.

The ocean's role in climate changes which affect human life and commerce received much attention. Research and technological developments making possible exploitation of the ocean's resources as well as further study of its evolution were discussed.

The possible development of ocean cities, especially if changes induced by human activity result in the rise of sea level and the inundation of low-lying areas, is very important, the committee concluded.

Committee VI

SPIRIT AND SCIENCE; IMAGINARY AND REALITY
Jean E. Charon, organizing chairman.

The committee dealt with the problem of mind and matter, the interaction between subject and object. The subject can be seen as thought (mind) and matter. But there is also the "I" who looks at his thoughts, said Charon. There should be a distinction between thought (mind) and the "I" which thinks thoughts, which might be called "spirit."

The problem of the interaction between mind and matter is becoming a central problem in science in all disciplines. To probe further into the objective world, it has become necessary to give more attention to the structure of the mind, the ways we are thinking.

The committee addressed these problems in an interdisciplinary way. Language, meaning, and symbol were important problems on the philosophical level. Biology, physics, and psychology were also important.

The committee concluded there was a need for a new methodology to address not only problems of matter but of psychomatter and of values in determining reality.

The final problem considered by the committee was a question of values: "The question of where mind is taking mind."

"I think we are really entering a new era in which we should say that human beings are not only thinking animals but also a living part of a thinking universe," Charon finished.

Committee VII

THE SEARCH FOR GLOBAL IDEOLOGY
Frederick E. Sontag, organizing chairman.

Composed of philosophers and theologians, the committee considered the question of an ideology which will allow room for all.

"In the past," Sontag said, "it was possible to accept our own ideological frame and ignore all others. That is not possible now." For the sake of peace and the health of our own culture, he said, it is crucial to search out global ideologies.

The committee considered whether Unification Thought offered a possible avenue of reconciling ideologies and creating a global ideology. The papers sought to find an ideology which could provide a global perspective and reconcile those which otherwise might simply clash.

Special Survey Committees:

Members of the two special survey committees attended sessions of the other committees and then met to compile their report.

SCIENCE AND VALUES.
Jan Knappert, chairman

Although the evaluation of the committee proceedings and papers differed widely; nevertheless, there occurred lively discussions in each committee. Thus, there was certainly an exchange of thoughts, which is the aim of such a congress, reported chairman Jan Knappert.

The standard of papers, generally, was praised, and the congress thought to be well worthwhile.

One criticism was that at times papers were too technical to be understood by someone who was not a specialist in that field.

It was suggested that chairpersons not be specialists in the committee subject matter so that they would have no inclination to favor certain speakers or a particular approach to a given subject and would notice immediately when a speaker became obscure.

The very nature of the ICUS discourses, concluded the "Values" committee, implies that they must be diverse and multi-disciplined in their approach to the central question: "Can the sciences be meaningfully and harmoniously unified?" Once having reached this exalted level of philosophical concentration, can science then answer the next question: "What has the highest value for human beings?"

The very nature of the two basic themes of the ICUS congress will always make it necessary to find an optimal conciliation between the diversity of human pursuits and the equally necessary attempts at reunification in order to ask ourselves: "Have we discovered something of value?"

UNITY OF SCIENCES.
Miguel Covian, chairman.

Unity of the sciences has to be understood as requiring the full cooperation of many disciplines, the chairman opened.

It was observed that no one discipline can be fully reduced to another, but rather that the various disciplines are seen as a network of different scientific models. Interdisciplinary research is of great importance, therefore, to scientific knowledge.

The search for "truth" is a common denominator which unifies science even when the various disciplines hold different philosophical positions, the committee suggested.

Each committee is working to produce a book, based on papers prepared for the ICUS meeting. The books will be published by Paragon Press and will be available by writing to: Paragon Press, Box 1311, New York, New York 10116. These books will be announced in *ICF Report* as they are published. Readers wanting more information on ICUS XIII (1984) may also obtain a conference program by writing to ICF at the above address.

Values and Benefits of Science Discussed by Drs. Weinberg and Wigner

Participants at one of ICUS's plenary addresses. Plenary speakers were (above) Dr. Alvin Weinberg and (below) Dr. Eugene Wigner.

Two major ongoing themes at the ICUS meetings have been "Unity of Knowledge" and "Science and Values." This year, to draw together the deliberations of the various committees into a more general focus, two eminent scholars presented plenary addresses based on these themes.

Dr. Alvin Weinberg, director of the Institute for Energy Analysis at Oak Ridge Associated Universities, Oak Ridge, Tennessee, discussed "Values in Science," while Dr. Eugene Wigner, Emeritus Professor of Physics at Princeton University and Nobel Laureate in Physics, presented "Reflections on the Role and Purpose of Science."

"Science is both its administration and its practice," Dr. Weinberg began. He defined administration of science as the art of choosing from among the many possible questions answerable by science which questions to ask. "Every administrator at whatever level is always deciding what science to support, what science not to support. Unfortunately, he must make these judgments before, not after, the science is practiced, and this requirement has given rise to a search for criteria of scientific choice. The enusing debate on scientific priorities has attracted considerable attention, especially among those formulating national scientific policy. Here is an instance of a rather philosophic question—How to judge the relative value of competing scientific activities—which at least in principle has urgent practical application."

Practice, he said, is the actual conduct of the research: theorizing, observation, interpretation of results, communication of results. Unity is the primary goal in the administration of science, while truth is the major goal of its practice. "To recognize unity as a value in pure science is hardly new. . . . Yet I have proposed a fundamental distinction between truth and unity: truth and unity are underlying values for science, but they apply to the different aspects of science. Truth is the underlying value for scientific practice, unity is the underlying value for the administration of pure science. Each pure scientific discovery or activity must satisfy a criterion of truth if it is to be recognized as a science; but the value of the discovery of the activity is measured by the unity that it imparts to the entire scientific edifice. . . . To propose that truth ought to share this prime position with unity—but the one in relation to scientific practice, the other in relation to administration of pure science—may appear to some to be pedantic or hair-splitting. Yet, on reflection, I see nothing so odd about the underlying values for the two aspects of sciences not necessarily being the same."

Are scientific values useful when applied to human affairs? There is enormous practical difficulty in transferring scientific values of truth to the political and social life of human beings, Weinberg warned. "Who shall decide where truth lies in the struggle between competing religions, political systems, or economic systems?" he asked. Unity, he proposed, is a more reasonable, practical and therefore more attractive value for human relations: "Just as scientific activity is embedded in a broader scientific matrix, and its merit judged by the unity it brings to that underlying scientific matrix, so each human activity, with all its diversity and variety, is embedded in a broader human matrix. The merit of that activity is judged by the degree to which that activity contributes to the unity, illumination, and ultimately, harmony of the many activities with which it enteracts," he said.

Dr. Weinberg concluded: "The problem of value is surely the most fundamental question in both science and in human affairs. And indeed, the difficulty of applying a broad criterion of value—unity—to actual human decisions must be formidable—probably just as formidable as the difficulties I mentioned in applying a criterion of truth to the judgment of human decisions. Yet one cannot but be intrigued that whenever we encounter strife in our imperfect world—between religious groups, between nations, between individuals—a resolution seems so often to appear in discovery and exploitation of common aspirations, beliefs, under-

continued on page 12

Aggression and War

Patterns of Inter-Male Aggression Among Humans and Non-Human Primates

Dr. Diane McGuinness

Stanford University
Stanford, CA

The following continues ICF Report's *series of feature articles. It is our intention to present a diversity of viewpoints. Hence we are not only hoping for additional articles but also we are looking for comments, questions and challenges regarding published articles.*

DETAIL OF JAPANESE SILK PAINTING (EDO PERIOD)

This discussion focuses on the relationship between non-human and human primate systems in terms of individual and group aggression and dominance systems. It came about as part of the work of an ICUS committee on the emotions, aggression, and dominance systems. The material studied consisted of films of non-human primates in both zoo and wild settings and in human traditional cultures and modern societies.

Inter-Male Aggression Among Non-Human Primates

Inter-male aggression among non-human primates is intra-specific. Unless undertaken in self-defense, aggression which is directed toward members of another species is almost entirely predatory in nature and is carnivorous. However, several behavior patterns will trigger aggression among males of the same species: a strange male entering the home range; violation of patterns of individual spacing within the home range; and violation of spacing between groups at the boundaries of adjacent ranges. To a lesser extent, aggression is related to the availability of food and oestrus females. These forms of aggression are exhibited in the presence of a strong linear dominance system led by the alpha male. A further precipitating factor for increased aggression is the loss of the alpha male, especially when this occurs suddenly.

Except in pair-bonding species, there are always more adult females than adult males in a troupe. (A possible exception is Pan paniscus, the Pigmy chimpanzee.) This occurs because the adult males either "disappear" or are killed by other adult males of the same species. Evidence indicates that these killings occur at troupe boundaries. Killings are extremely rare within a long-standing troupe, if they occur at all. No cannibalism has ever been reported in connection with adult killings. These conclusions hold not only for monkey species, but also for the chimpanzee (Pan troglodytes) and gorilla.

Cannibalism has been observed with respect to infant killings by males. There is currently a great deal of controversy over the frequency of infanticide and species' differences in this behavior. However, infanticide is very rare in the great apes, while among the chimpanzee only eight infanticides by males have been reported for both Combe and Mahali ranges in a 10-year period. (Some anthropologists including Jane Lancaster argue that this figure does not constitute "rare" in view of the small populations involved.) Male infants are more frequent victims, but this cannot possibly account for the disparate sex ratios, which in the chimpanzee are approximately 1.5 to 2 adult females to 1 adult male.

Dominance Systems in the Non-Human Primate

Male dominance ranks in all mammals are linear. The alpha male forms alliances with other adult males, usually, but not always, with those next in rank. Male dominance is often dependent upon female support, especially from the mother and related kin. Dominance is related to social context and may be related to "victories" in rough and tumble play. Dominance appears to be determined by three major factors: kinship support, confidence, and "desire" to be assertive, since not all mates actively seek alpha status but maintain their position in the ranks only by responding to threat. Dominance ranks are clearly acknowledged or perceived to exist by all males within the troupe, including sub-adults. Dominance ranks are responsible for diminishing aggression within a troupe. With a dominance system in place, a completely harmonious environment can be maintained for years at a time. This harmony is disrupted the instant the alpha male dies.

Among females, dominance systems depend upon kinship status. All members within the top kinship group often dominate members of other kinship groups. Within kinship groups, ranks are not linear, with the exception of Rhesus Macaque. The head of the alpha kinship group (the alpha female) is often the oldest mother with the largest number of living offspring.

Human Inter-male Aggression: Similarities to Non-human Primates

Human inter-male aggression operates via the same triggers as non-human primate inter-male aggression, especially with respect to the factors of inter-individual spacing and demarcating group boundaries. Human male children are known to behave aggressively to strange male children (newcomers).

The effect of the loss of the alpha male on human aggression has not been studied scientifically. We can only speak of a situation called a "power vacuum," but we do not understand its dynamics.

Recent data shows that human males are more likely to abuse children unrelated by blood (step-children) than their own. Human mothers are more likely to abuse their children than human fathers.

Human Dominance Systems: Similarities to Non-Human Primates

Human male dominance systems are strictly linear in rank. The alpha male forms alliances with males near in rank; "best friends" are generally found to be adjacent in rank. Dominance is related to success in interactions during rough-

and-tumble play. Dominance ranks are related to confidence and desire for status.

Among humans, dominance ranks are tacitly acknowledged as well as consciously perceived by all males involved, not only by participants but by outside observers. This perception occurs with 100% accuracy.

Dominance ranks reduce not only aggression but also distress. From the age of three to four years, males actively seek to establish a linear dominance system and are comfortable when it is in place.

Females do not form linear dominance ranks. Instead, they form a dominant "coalition" in which no one member is dominant over the other, but the group is dominant over most other females (sometimes called a "clique"). This has been studied only in children in the United states and has not been studied in traditional cultures. It is not known whether dominance is related to kinship networks in females, nor how dominance is established among females who are strangers.

Differences between Human and Non-human Primates

In humans, adult male and female populations are approximately equal. Males do not disappear. In this humans resemble the pigmy chimpanzee but no other primate.

In hunter-gatherer societies, which consist of groups of 30 or so individuals with complete ecological freedom to fission into smaller groups, inter-male aggression is extremely rare. Again, there is a greater similarity to the pigmy chimpanzee and a dissimilarity to all other non-human primates. It could be argued that in a world of reasonable abundance and space, humans by nature are less aggressive than non-human primates. They do not dispense with a portion of adult males.

A major shift occurs with increasing population density, which forces societies to focus on specific food-producing techniques, e.g. horticulture and herding. Horticulture and herding have the advantage of feeding more people, but the disadvantage of involving more labor, increased vulnerability to adverse weather conditions, and increasing the population. Agriculture accelerates exponentially all the problems inherent in horticulture. Because of changed muscle/fat ratio, sedentary females give birth every two years instead of every four, as with the hunter/gatherers and the great apes. An example of positive feed-back systems, population growth leads to sedentary living which leads to more population growth.

With more restricted movement in the environment, group boundaries become of primary importance. It is possible, though not documented, that aggression increased in proportion to the rigidity of boundaries. Wars have been fought more often by adjacent countries.

Humans share foods and goods; apes do not. One solution to diminishing friction at boundaries is to form alliances. Alliances are mechanisms by which high-ranking males can work together (similar to non-human primate systems) and where "sharing" is codified into rules of trade. Trade alliances (sharing) reduce warfare.

DETAIL OF GREEK POTTERY (C. 500 B.C.)

Human behavior is largely the result of the biological propensities which stem from being a sharing primate coupled with the solutions imposed by ecological constraints. Human culture consists of behaviors which are represented in consciousness and elaborated through rituals, rules and symbols.

Cultures differ because they have arrived at differing sets of reasons, rationalizations, and rules for a similar set of basic behaviors. They also differ in the upper and lower limits (range) set on the expression of any particular behavior.

Alliances (a primate predisposition) and symbolic systems combine to evolve into a purely intellectual concept of the "common bond." At the most basic level, a bond is formed because of familiarity, i.e. derived through direct face-to-face interaction. In complex societies, bonds can become extensions of intellectual "familiarity," such as common languages, common religious and ideological belief systems. These belief systems both unite and divide human social groups.

Not only individual but aggregates of individuals operate over time in an oscillation between unity and individuality. Overly restrictive requirements for group allegiance tend to promote the desire to assert individuality. (Freedom is essentially the degree to which one is able to assert one's individual desires.) With too much freedom, one is ultimately divorced from the group entirely, e.g. is alienated. This oscillation has been historically a feature of the development of nation states and still continues.

The propensity for humans to manufacture tools has led to a second type of positive feed-back, beginning with the discovery that tools can become instruments of inter-male aggression to the second step where tools are developed to destroy other tools. The arms race is a clear example of a positive feed-back system. Positive feed-backs almost inevitably run out of control.

Human Warfare

Wars occur at boundaries and are of two types. The first type involves face-to-face encounters, where the skill of the warrior is of paramount importance. Because of the skills necessary and the high degree of rule-governed behavior, face-to-face warfare often resembles organized games. Warfare differs from games only in that the express purpose is the intent to harm members of the opposing side.

The second type of warfare results from a change in scale, when face-to-face interaction is lost. There wars function largely through expertise in devising systems of weaponry rather than through individual skill in their deployment.

Wars are controlled—either escalated or diminished—by alpha males.

Motivations for war are also of two kinds. Wars are fought for reasons similar to those promoting inter-group boundary conflicts in non-human primates: resources (economics) and spacing (territory). Humans also fight groups who threaten the loss of an alliance. This second type of war is peculiarly human and is related to the human capacity for empathy and the ability to feel affinity for unknown individuals. In this latter category are wars against an oppressor.

Rationalizations invoking God, Truth, or ideologies can function in connection with the active promotion of hatred for the outgroup in order to establish a common bond or purpose.

Plenary Address

continued from page 9

standings of the contestants. . . . Today, East and West, communist and non-communist seem to be in irreconcilable struggle. Yet," Weinberg ended, "through common aspirations and understandings—the common desire to avoid thermonuclear annihilation—can we not find sufficient overarching unity to avoid this awful disaster?"

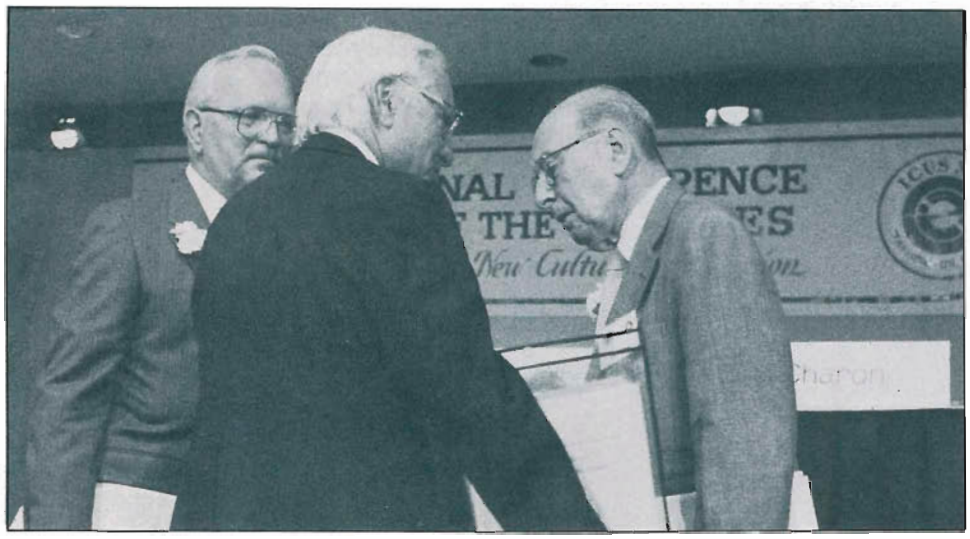
Dr. Eugene Wigner stated that the primary concern of his plenary address: "Reflections on the Role and Purpose of Science," was the effect of the growth of science on man's happiness.

The development of science in the last 300 years, he said, has "caused an increased wealth, an increased possibility for man to devote his attention to the acquisition and creation of knowledge—both abstract and practical." The growth of science, he observed, has changed our lives very fundamentally. One basic example is the increase of life expectancy in the US from 30 years at the beginning of this century to the current figure of 71 years.

Science, Dr. Wigner said, has not only made man's life longer but also physically easier. Unfortunately, we are left with an emotional void. "Man wants to strive for something and the purpose which occupied earlier generations, the acquisition of the necessities of life, is too easily achieved. This is a serious problem of our times."

While science has removed a sense of purpose by making material progress easier, it also brings its own pleasure which one experiences through its study. "I remember how much pleasure I derived already as a high school student from recognizing laws of geometry. I found a proof not given in the books I knew, of the theorem that the three altitudes of a triangle meet at a common point. But I derived even more pleasure from attending, every other Thursday, a joint seminar at which one of our colleagues presented ideas."

Dr. Wigner recommended the establishment of scientific discussion clubs in schools and workplaces: "It would not only provide some pleasure to the participants, as it provided for me, but also acquaint them with the main ideas and characteristics of science—giving pleasure and interest. It could hardly contribute new ideas to science, but it would make later interest in science more general."



Plenary speakers Dr. Weinberg and Dr. Wigner with conference moderator Dr. Claude Villee (left).

ICF Report

G.P.O. Box 1311
New York, N.Y. 10116

NON-PROFIT ORG.
U.S. POSTAGE
PAID
New York, N.Y.
Permit No. 689