

CONACYT

Consejo
Nacional
de
Ciencia
y
Tecnología
Mexico City

Science and Man in the Americas

Mexico City 20 June to 4 July 1973



American
Association
for the
Advancement
of
Science
Washington, D.C.

The inter-American meeting on "Science and Man in the Americas," jointly organized by the American Association for the Advancement of Science and by the Consejo Nacional de Ciencia y Tecnología of Mexico, is summarized below in its main programmatic constituencies. Its aims and expectations are to discuss, in public, topics of crucial concern to the inhabitants of the Americas. Developmental problems affecting their well-being, research results clarifying the understanding of the world in which they live, discussions of goals and attitudes toward the future—all will be pursued by many participants, more than half coming from Mexico, Latin America, and abroad.

It is a declaration of faith among people of good will and common ideals that the fortunes of people everywhere can be advanced by the wise application of scientific insights. Students will show their best efforts and research results. They will be welcomed to participate in the discussions. The public will be invited to enjoy general lectures, films, and exhibits. Through radio, television, and through the written word, the meeting will expand its bounds to include responsive audiences wherever they exist. It should be a joyful occasion—reflective, stimulating, and creative.

W. G. BERL

President Luis Echeverría, the Honorary General Chairman, will speak at the Opening Ceremony, in the morning of 20 June.

Invited Lectures

- 20 June Eugenio Mendez Docurro (Secretary General, CONACYT; Minister of Transportation, Mexico, D.F.)
Topic: to be announced
- 21 June Eugenie Clark (Department of Zoology, University of Maryland, College Park, Maryland)
Topic: A Research Diver Looks at Mexican "Sleeping" Sharks and Red Sea Garden Eels
- 22 June Joaquin Cravioto (Chief, Institute of Scientific Investigation, Mexican Institute of Child Care, Mexico, D.F.)
Topic: The Children of the World in Which We Live
- 23 June Norman Borlaug (Nobel Laureate, International Institute for the Improvement of Corn and Wheat, Mexico, D.F.)
Topic: Civilization's Future—Was Malthus Correct?
- 25 June Carlos Graef Fernandez (National Institute of Nuclear Energy, Mexico, D.F.)
Topic: to be announced
- 26 June Jacob Bronowski (Salk Institute, La Jolla, California)
Topic: Science and Human Values
- 27 June Sol Linowitz (Former Ambassador of the United States to the Organization of American States and Chairman of the National Urban Coalition)
Topic: The Futures of the Americas
- 28 June Glenn T. Seaborg (Nobel Laureate; Chairman of the Board, AAAS; Department of Chemistry, University of California, Berkeley, California)
Topic: Science, Technology and Development: A New World Outlook
- 29 June Speaker and topic to be announced
- 2 July Letitia E. Obeng (Institute of Aquatic Biology, Council for Scientific and Industrial Research, Accra, Ghana)
Topic: Science, Technology, Human Progress and African Viewpoints
- 3 July Camillo Flores (Secretary General, United Nations Population Conference 1974, United Nations, New York, New York)
Topic: Human Rights in Today's World



Earthquakes and Earthquake Engineering

Arranged by Enrique del Valle C. (Mexico) and Don Tocher (United States).

20 June. 3:00 p.m. Chairman: Emilio Rosenblueth (Mexico). Introduction, Emilio Rosenblueth; "Tectonic setting for the 1972 Managua earthquake," Don Tocher; "Strong-motion instrument data from the Managua earthquake," R. B. Matthiesen (United States); "Some aspects of the 1972 Managua earthquake," Federico Fiedler (Nicaragua); "Case studies of the Managua earthquake," Enrique del Valle; "Collapse of two-story structures," Raúl Husid (Chile); "Central Park Towers in Caracas," Mario Paparoni (Venezuela); "Inelastic earthquake analysis by the reserve energy technique," John A. Blume (United States).

21 June. 9:00 a.m. Chairman: Don Tocher. "Engineering implications of seismic zoning," Alan Davenport (Canada); "Commentary on seismic risk estimation," Luis Esteva (Mexico); "Measurements of destructive earthquake ground motion," Donald E. Hudson (United States); "Seismic risk analysis in Canada," William Milne (Canada); "Historical seismicity of the Caribbean," José Grases (Venezuela); "Seismic zoning," Alberto Giesecke (Peru).

3:00 p.m. Chairman: Luis Esteva. "Earthquake engineering research in Peru," Julio Kuroiwa (Peru); "Earthquake engineering research, University of California, Berkeley," Joseph Penzien (United States); "Earthquake engineering research in Mexico," Emilio

Central Themes

Rosenblueth; "The UNAM-UNESCO Soil Dynamics Project," Jorge Prince (Mexico) and Ezio Faccioli (Mexico); "Probabilistic applications in aseismic design," Patricio Ruiz (Chile); "Earthquake resistant masonry," Roberto Meli (Mexico).

22 June. 9:00 a.m. Chairman: Enrique del Valle. "Seismic intensity and smoothed spectra," Arturo Arias (Chile); "Seismic zoning and structural design," R. B. Matthiesen; "Estimation of ground movement during earthquakes," Raúl Husid; a round-table discussion: Arturo Arias, Alan Davenport, José Grases, Julio Kuroiwa, Joseph Penzien, and Emilio Rosenblueth.

Nonnuclear Energy for Development

Arranged by Edmundo de Alba (Mexico) and J. Frederick Weinhold (United States).

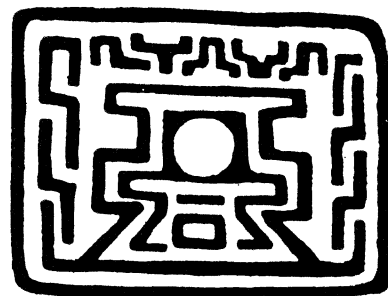
20 June. 3:00 p.m. "The World Energy Situation." Chairman: J. Frederick Weinhold. "The United States perspective," S. David Freeman (United States); "The European community and the world energy situation," Jean C. Lelercq (Belgium).

21 June. 9:00 a.m. "Energy in the Americas." Chairman: Edmundo de Alba. "Energy for development," Fernando Hiriart (Mexico); "Electrical energy," Rodolfo Tellería (Venezuela); "Canada's energy supply and demand situation," Gordon McNabb (Canada).

3:00 p.m. "Energy for Rural Communities." Chairman to be announced. "The present situation in rural electrification," Francisco Monteverde (Mexico); "Bringing electric power into rural communities," Thomas Venables (United States); "Improving the efficiency of rural electrification," J. Neal Thompson (United States).

22 June. 9:00 a.m. "Solar and Wind Energy." Chairman: to be announced. Julio Hirschmann R. (Chile); Peter Glaser (United States); Robert C. Axtmann (United States); C. Bettignies (Canada).

3:00 p.m. "Geothermal Power." A joint session with the Symposium on Volcanism in Mexico and Central America.



23 June. 9:00 a.m. Round-table discussion. "Environmental aspects of energy," Miguel Angel García Lara (Mexico). Keynote: Juan Eibenschutz (Mexico); participants: above speakers.

Nutrition and New Food Technology

Arranged by Theodore C. Byerly (United States) and Rafael Rojas (Mexico).

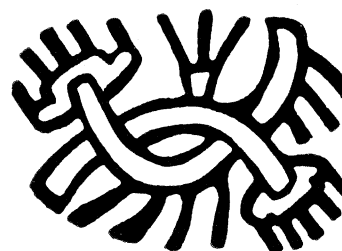
20 June. 3:00 p.m. "Food Supply." Chairman: F. Cardenas Ramos (Mexico); vice chairman: M. Rutman (Chile). "Evaluation of the impact of the green revolution," Dana Dalrymple (United States) and William I. Jones (United States); "Increase in genetic yield capacity of cereals," E. F. Sprague (Mexico); "The use of ruminants and nonruminants as cheap converters of waste foodstuffs," T. R. Preston (Italy); "The development of fisheries and fish processing in developing countries," Georg A. Borgstrom (United States).

21 June. 9:00 a.m. "The Socioeconomics of Food Distribution and Supply." Chairman: J. Tena Tafuya (Mexico); vice chairman: Evelyn Johnson (United States). "Technology transfer and technological scale," M. Szekely and G. Viniegra (Mexico); "Opportunities for developing the food industry in rural and urban Latin America," R. Bressani (Guatemala); "Improving the nutrition awareness of low-income groups—the U.S. experience," Evelyn Johnson; "Community nutrition programs—mother craft centers," Miriam M. Chávez (Mexico).

3:00 p.m. "Food Technology." Chair-

Please Note

Program listings are provisional. Minor changes in speakers, topics, and dates may occur.



man: H. A. B. Parpia (India); vice chairman: M. A. Jiménez (United States). "Storage of grains—alternative strategies," C. M. Christensen (United States); "Postharvest handling of fresh fruits and vegetables," A. Gorgatti (Brazil); "Food processing needs of developing countries," A. Kramer (United States); "Potential of new food sources," C. O. Chichester (United States).

22 June. 9:00 a.m. "Food Processing." Chairman: Walter MacLinn (United States); vice chairman: J. Pérez Villaseñor (Mexico). "Enzymes in food processing," Luz María del Castillo (Mexico); "Texture and texturization," Frank Horan (United States); "Nutrition and processing technology," H. A. B. Parpia; "Sensory evaluation," Margy Villalobos (Colombia); "Newer developments in food packaging," William J. Gall (Canada).

3:00 p.m. "Food Safety." Chairman: Roy E. Morse (United States); vice chairman: Gerald F. Combs (United States). "Microbial toxins," F. R. Senti (United States); "Food plant sanitation," J. H. Silliker (United States); "Heavy metals," Donald Huisinigh (United States); "Pesticide residues," B. G. Tweedy (United States); "Utilization and management of food processing wastes," Sam R. Hoover (United States).

23 June. 9:00 a.m. "Food Standards and Regulations in Latin America." Chairman: Harry Mussman (United States); vice chairman: A. Olszyna Marzys (Guatemala). "Food standards and regulations in Latin America," A. Olszyna Marzys; "Food quality protection in the United States," Robert Angelotti (United States); "The value and implications of the Codex Alimentarius," E. R. Méndez (Mexico); summary talk, William J. Darby (United States).

Deserts and Arid Lands

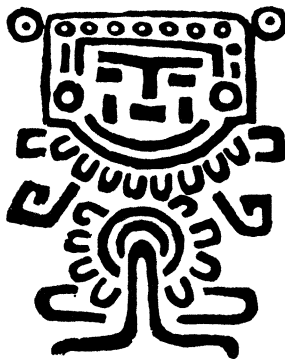
Arranged by Harold E. Dregne (United States) and Fernando Medellín Leal (Mexico).

25 June. 9:00 a.m. Chairman: Fernando Medellín Leal (Mexico). "Planning problems in the development of arid zones," Enrique Beltrán (Mexico); "The dilemma of development of arid lands," Thomas Maddock, Jr. (United States).

3:00 p.m. Cochairmen: Stahlr Edmunds (United States) and Gabriel Murillo Peralta (Mexico). "Solar energy in arid lands," Hector Ruiz Elías

(Mexico) and Gustavo del Castillo (Mexico); "The potential of solar energy as an arid land resource," Adam B. Meinel and Marjorie P. Meinel (United States); "Useful and potentially useful plants of Mexican arid zones," Jerzy Rzedowski (Mexico); "Improving utilization of native vegetation in the arid zones," Edward F. Haase (United States); "Shrubs, a neglected resource of arid lands," Cyrus M. McKell (United States). Discussants: Mario Pérez C. (Bolivia) and Gastón Guzmán (Mexico).

26 June. 9:00 a.m. Cochairmen: Terah L. Smiley (United States) and José Lizárraga Reyes (Peru). "Desalting in the arid regions," Ronald F. Probst (United States); "Research on rain water harvesting and conservation in the Mexican valley," Manuel Anaya G. (Mexico); "Potentials and problems in water harvesting," Lloyd E. Myers (United States); "Increasing



water use efficiency," Hasan Qashu (United States) and Oscar Benassini (Mexico); "Alternate uses of land," Marion Clawson (United States). Discussants: Arturo Cornejo T. (Peru) and Mario Castro G. (Mexico).

3:00 p.m. Cochairmen: Richard B. Woodbury (United States) and Patricio Dreckman (Chile). "Educational and cultural needs of desert zone inhabitants," Blanca Jiménez Lozano (Mexico); "Education in isolated rural areas," Everett D. Edington (United States); "Cultural patterns distinctive to arid zones," Theodore Downing (United States); "Remote sensing for arid land development," Marion F. Baumgardner (United States); "Crop production in controlled environments," Carl N. Hodges (United States). Discussants: Luis Fuentes Aguilar (Mexico) and Fausto García Castañeda (Mexico). Filmstrip, "Proyecto San Juan Raya" (Mexico).

27 June. 9:00 a.m. Cochairmen: Dean F. Peterson (United States) and Antonio J. Prego (Argentina). "Collection, storage, recovery and distribution of arid zone data," Guadalupe Carrión

(Mexico); "International collaboration in data storage and retrieval," Patricia Paylore (United States); "Mexican participation in the international hydrological decade," Rodolfo del Arenal (Mexico). Discussants: Virgilio G. Roig (Argentina) and Carlos Zamora Jimeno (Peru).

11:00 a.m. Chairman: Harold E. Dregne (United States). "Man and desertification," Mohammed Kassas (Egypt).

The Sea and Its Resources

Arranged by Agustín Ayala Castañares (Mexico) and Arthur E. Maxwell (United States).

25 June. 9:00 a.m. General introduction, Harris B. Stewart (United States). "Coastal zone resources and their management," Bostwick H. Ketchum (United States); "Ocean effects on weather and climate," Julián Adém (Mexico).

3:00 p.m. "Nonrenewable Resources," Robert R. Lankford (Mexico); "Living resources," Marta Vannucci (Mexico); "Ocean affairs," Warren S. Wooster (United States).

26 June. 9:00 a.m. "Coastal Zone Resources and Their Management." Chairman: Bostwick H. Ketchum. "Characteristics and uses of coastal zone," Hermann Ugarte (Peru); "Mineral resources" (oil, salt, sulfur, and so forth), Richard G. Bader (United States); "Biological resources" (fishing, aquaculture, and so forth), Gilberto Rodríguez (Venezuela); "Pollution and impact on resources," Enrique Mandelli (Venezuela); "Management and allocation of coastal resources," Robert Warren (United States).

3:00 p.m. "Ocean Effects on Weather and Climate." Chairman: Julián Adém. "Long range impact on weather and climate," Donald Gilman (United States); "Severe storms," R. Simpson (United States); "GATE" (GARP Atlantic Tropical Experiment), J. Kuettner (Switzerland); "Satellite surveillance of ocean and weather," Jay S. Winston (United States); "Numerical modeling of coupled air-sea systems," Kirk Bryan (United States).

27 June. 9:00 a.m. "Nonrenewable Resources." Chairman: Robert R. Lankford. "Information resources of the sea floor—paleoenvironmental data and investigation regarding the search for nonrenewable resources: (a) uniformitarianism; (b) near surface investigations, places, authigenics, and so



forth," Fred B. Phleger (United States); "Shelf exploration—geophysics/shallow exploratory drilling/sampling history, development and trends," Alberto G. Lonardi (Argentina); "Sea bed mineral resources," John P. Albers (United States); "Subsurface resources—petroleum, gas, sulfur, other chemical deposits," Guillermo P. Salas and Francisco Viniegra Osorio (Mexico); "Deep sea drilling program results as related to resources," Melvin Peterson (United States); "Technology of subsea mineral exploitation," John Mero (United States).

3:00 p.m. "Living Resources." Chairman: Marta Vannucci. "The living resources in the seas around the Americas," Mario Ruivo (Italy); "Conventional and unconventional methods of assessment of living resources," P. LaViolette (United States); "Management of living resources," Jorge Carranza Fraser (Mexico); "Management of living resources—case histories," O. Guillen (Peru); "Pelagic resources, deep, medium and shallow depths," James Joseph (United States); "The U.S.A. sea grant program and living resources from the sea," A. Novak (United States).

28 June. 9:00 a.m. "Ocean Affairs." Chairman: Warren S. Wooster. "Conduct and management of ocean research: The scientist's view," John A. Knauss (United States); "The lawyer's view," Jorge Vargas (Mexico); "Development of oceanographic capabilities," Marta Vannucci; "International cooperation in ocean science," Harris B. Stewart (United States); "Oceanography and the development of living resources," Geoffrey Kesteven (Mexico).

Opportunities in Education

Arranged by Don Adams (United States), Albert Baez (United States), Manuel Bravo (Mexico), Guillermo Massieu (Mexico), Oscar Méndez Napoles (Mexico), and Thomas Taylor (United States).

Topics in the utilization of educational technology in the improvement

of science education; the special role of experimentation in learning science; understanding the learning process and the external factors that affect it; the Open University and other means of effecting wide territorial coverage and continuing education; the role of planning in education; improving the initial and in-service education of teachers.

Detailed listing of topics and speakers will be published at a later date.

Educational Planning

Arranged by Don Adams (United States) and Manuel Bravo Jiménez (Mexico).

29 June. 9:00 a.m. "Toward Qualitative Educational Planning." Cochairmen: Don Adams and Manuel Bravo Jiménez. "The role of educational planning in the process of social development: Mexico," Roger Díaz de Cossio (Mexico); "Planning for multi-dimensional educational objectives," Hernan Vera (United States); "The Faure report: Some implications for educational planning," William Platt (France); title to be announced, Douglas Wright (Canada); "Participatory planning in educational decision making," Bernard Kaplan (United States); "University planning in Spain," Antonia Ramos (Spain).

3:00 p.m. "Quantitative Aspects of Educational Planning." Cochairmen: Don Adams and Manuel Bravo Jiménez. "Simulation model of Mexican educational planning," José Antonio Carranza Palacios (Mexico); "Decision models for planning technologically assisted education," Hector Correa (United States); "Problems of measurement of productivity in education," Oscar Méndez-Nápoles (Mexico); "Canadian experience in the application of quantitative and mathematical models for educational planning," Cicely Watson (Canada); "Expanding the scope of educational planning and the experience of Chile," Ernesto Sheifelbein (United

States) and Joseph Farrell (Canada); title to be announced, Juan Chong (Peru).

30 June. 3:00 p.m. "Implementing Educational Change." Cochairmen: Don Adams and Manuel Bravo Jiménez. "Consequences of excessive educational planning," Guy Benveniste (United States); "Problems of implementing educational development planning," Jaime Castrejón Díez (Mexico); "Advances in information systems in educational planning," Hector Sierra Elizondo (Mexico); title to be announced, Simón Romero-Lozano (Chile); "The administration of rational plans in education: A development dilemma," Paul Watson (United States); title to be announced, Manuel Pérez-Rocha (Mexico).

Problems of Population

Arranged by Gustavo Cabrera (Mexico) and Roger Revelle (United States).

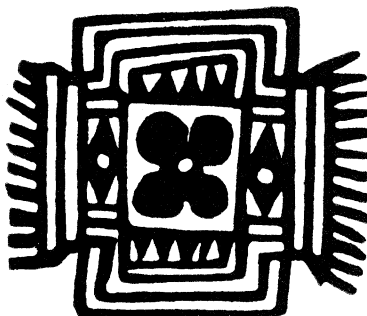
26 June. "I. Urbanization and Internal Migration." 9:00 a.m. "The Process of Migration as a Factor of Social Change." Chairman: Larissa Lomnitz (Mexico). Speakers: Juárez Brandao Lopez (Brazil), and Karl Tauber (United States), Sergio Vargas (Mexico), David Goldberg (United States). Discussants: Gino Germani (United States), Mario Margulis (Argentina), John J. Macisco, Jr. (United States).

3:00 p.m. "The Crisis of the Cities." Chairman: Kingsley Davis (United States). Speakers: Ramiro Cardona (Colombia) and Robert Wood (United States). Discussants: Harley Browning (United States) and Luis Unikel (Mexico).

27 June. "II. Economic and Social Problems of Population Growth." 9:00 a.m. "Employment and Economic Development." Chairman: Eduardo Arriaga (Argentina). Speakers: Francisco Javier Alejo (Mexico) and Allen Kelley (United States). Discussants: George Stolnitz (United States) and Mercedes Pedrero Nieto (Mexico).

11:00 a.m. "Population, Health and Nutrition." Chairman: Roger Revelle (United States). Speakers: Luis Peregrina (Mexico) and Roy D. Brown (United States). Discussants: Doris Calloway (United States) and Daniel Bermeo Chaparro (Colombia).

4:00 p.m. "Education and Socio-cultural Changes." Chairman: Gustavo Cabrera. Speakers: Gregorio Weinberg



(Argentina) and Dudley Kirk (United States). Discussants: Eleanor Sheldon (United States) and Jorge Arevalo (Chile).

28 June. "III. Population Policy." 9:00 a.m. "Population Policy: Nature's Limits and Capacity." Chairman: Judith Blake Davis (United States). Speakers: Raúl Benítez Zenteno (Mexico) and Robert Parke (United States). Discussants: Paul Demeny (United States) and José Luis Reyna (Mexico).

11:00 a.m. "Integration of Population Policies in the Economic and Social Development." Chairman: Víctor Urquidi (Mexico). Speakers: Eduardo Arraiga (Argentina) and Judith Blake Davis (United States). Discussants: Myron Weiner (United States) and Susanna Lerner (Mexico).

4:00 p.m. "Description and Evaluation of Experiences of Different Countries." Chairman: John J. Macisco, Jr. (United States). Speakers: María Luisa García (Chile) and Frederick S. Jaffe (United States). Discussants: David Goldberg (United States) and Brigida García (Dominican Republic).

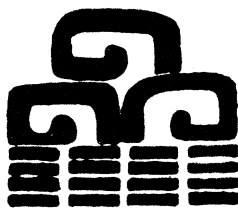
Ecology and Deterioration of the Environment

Arranged by Eduardo Escheverría (Mexico) and William D. Ruckelshaus (United States).

27 June. 9:00 a.m. "Technological Development without Pollution: Is the Cost Too Great?" Cochairmen: Eduardo Escheverría and Stanley Greenfield. (a) "Economic growth and environmental quality," Larry Ruff (United States); commentator: Paulo Vieyra (Mexico); (b) "The cost of clean growth: An international comparison," Jean P. Barde (France); commentator: Richard Judy (Canada).

3:00 p.m. "Agricultural Pollution: Balancing Human and Ecological Needs." Chairman: Eduardo Escheverría. (a) "The use of pesticides: A necessity for the developing countries," Alejandro Ortega-Corona (Mexico); commentator: Dale Lindsay (United States); (b) "Rural run-off and water quality," Robin L. Vannote (United States); commentator: Norman E. Borlaug (Mexico).

28 June. 9:00 a.m. "The Price of Pollution: Its Cost in Human Health." Chairman: Stanley Greenfield. (a) "A ubiquitous problem: Air and water pollutants," Vaun Newill (United States); commentator: Miguel Angel



Gil Corrales (Mexico); (b) "Specific problems: Chemicals and other pollutants," Douglas H. K. Lee (United States); commentator: Carlos Díaz Coller (Mexico).

3:00 p.m. "Bacteriological Pollution of Water: Its Impact on Human Health." Chairman: Eduardo Escheverría. (a) "Amebiasis: Socioeconomic impact," Bernardo Sepulveda (Mexico); commentator: Marion Brooke (United States); (b) "Water as a vehicle for bacteriological pollution," Blanca Raquel Ordóñez (Mexico); commentator: Jorge Vilchis Villaseñor (Mexico).

29 June. 9:00 a.m. "The Cities: Providing a Livable Environment." Chairman: Stanley Greenfield. (a) "The urban environment," Jerome Kretchmer (United States); commentator: Roberto Eibenschutz (Mexico); (b) "Humanizing the cities," Peter Self (England); commentator: Peter House (United States).

3:00 p.m. "Land-Use Planning: Insuring Rational Growth." Cochairmen: Eduardo Escheverría and Stanley Greenfield. (a) "The future of integrated land-use planning," Jesús Vázquez Soto (Mexico); commentator: Emilio Alanís Patino (Mexico); (b) "Key issues and approaches to land-use planning," Rowley Barlow (United States); commentator: Oscar Brauer Herrera (Mexico).

The Earth Sciences in World Development

Arranged by Earl Ingerson (United States) and Guillermo P. Salas (Mexico).

2 July. 9:00 a.m. Introductory address, Guillermo P. Salas (Mexico); "Minerals for civilization," Charles F. Park (United States). "Earth sciences contribution to the world energy problem," Fernando Alba Andrade (Mexico); "Earth sciences participation in the nuclear energy problem in South America," P. S. Stepanic (Argentina); "Geochemistry of origin and search of hidden ore deposits," Earl Ingerson (United States); "Earth sciences application in the solution of the world's

energy problem through the hydrocarbons," Eduardo J. Guzmán (Mexico); "The geological sciences in the solution of the environment problems derived from industrial, economical and social development," P. T. Flawn (United States).

3:00 p.m. "Regional geologic research as a base for the Mexican extractive industry," Diego A. Córdoba (Mexico); "Mining-geologic exploration, a basic factor in economic development of South American countries," Carlos Ruiz Fuller (Chile); "Earth sciences participation in economic development of Central American countries," Enrique Levy (Guatemala).

Science, Development and Human Values

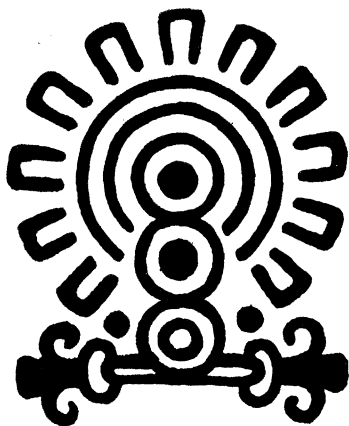
Arranged by Harrison Brown (United States) and Víctor Urquidi (Mexico).

2 July. 9:00 a.m. "Overview of the Human Condition." Chairperson: Olga Pellicer de Brody (Mexico). "Where have the rich nations gone wrong? Where have the poor nations gone wrong?" Speaker: Guillermo Massieu (Mexico). Discussants: Antonio Bacigalupo (Peru) and Hollis Chenery (United States). Speaker: Kenneth E. Boulding (United States). Discussants: Enrique d'Etigny (Chile) and Rodrigo Botero (Colombia).

3:00 p.m. "Knowledge and Development in Latin America." Chairperson: Renee C. Fox (United States). "Human values and happiness: Basic wants and needs." Speaker: Carlos A. Mallman (Argentina). Discussants: Luis Villoro (Mexico) and Richard Greigo (United States). "Research priorities for economic development in Latin America." Speaker: José Valenzuela (Chile). Discussants: David Ibarra (Mexico) and Norman Borlaug (Mexico).

3 July. 9:00 a.m. "Science, Technology and Human Welfare in the Inter-American Context." Chairperson: Eloisa Mano (Brazil). "The value of science and technology to human welfare." Speaker: Luis Manuel Penalver (Venezuela). Discussants: George Bugliarello (United States) and Gerhard Jacob (Brazil). Speaker: Joseph B. Platt (United States). Discussants: Marcos Kaplan (Argentina) and Marcos Moshinsky (Mexico).

3:00 p.m. Summary and Conclusions, Víctor Urquidi (Mexico) and Harrison Brown (United States); speakers from previous sessions.



HEALTH—EDUCATION— SOCIAL SCIENCES

Effects of Inadequate Nutrition on Human Development

Arranged by Nevin S. Scrimshaw (United States) and Salvador Zubirán (Mexico).

25 June. 9:00 a.m. "Nutrition and Reproductive Potential." Chairman: Salvador Zubirán. "The consequences of undernutrition on the genetic material," Salvador Armendares (Mexico); "Placental function in the undernourished woman," Aaron Lechtig (Peru); "Nutrition and communal reproductive pattern," Adolfo Chávez (Mexico). "Nutrition, Infection, and Health." Chairman: Salvador Zubirán. "Nutrition and the immune response," Jesús Kumate (Mexico); "The undernutrition-disease complex," Nevin S. Scrimshaw; "Nutritional status and communal health," Joao Salomon (Brazil).

300 p.m. "Nutrition and Infant Development." Chairman: Nevin S. Scrimshaw. "Nutrition and physical growth," Rafael Ramos Galván (Mexico); "Intellectual behavior in poor communities," Joaquin Cravioto (Mexico); "Social behavior in the undernourished," Leonardo Sinisterra (Colombia). "Nutrition and Socioeconomical Development." Chairman: Nevin S. Scrimshaw. "The social impact of malnutrition," Pedro D. Martínez (Mexico); "Interrelations between nutrition and economy," David Call (United States); "The Mexican national nutrition program," Salvador Zubirán.

The illustrations used are from Design Motifs of Ancient Mexico by Jorge Enciso, published by Dover Publications, Inc., New York.

Technical Symposia

Neurohumoral Coding of Brain Function

Arranged by René Raúl Drucker-Colín (Mexico) and Robert D. Myers (United States).

26 June. 9:00 a.m. "Molecular Correlates of Brain Function." Chairman: F. Anton-Tay. "The role of GABA metabolism in the regulation of cerebral excitability," Ricardo Tapia (Mexico); "Axoplasmic transport in the basal ganglia," Patrick L. McGeer (Canada); "Cyclic AMP and the inhibition of cerebellar Purkinje cells by non-adrenergic synapses," Floyd E. Bloom (United States); "Evidence for cholinergic transmission in the cerebral cortex," J. W. Phillis (Canada).

3:00 p.m. "Neurohumoral Mechanisms in Basic Physiologic Functions." Chairman: H. O. J. Collier (England). "Coding of metabolic information by hepatic glucoammonium receptors," Mauricio Russek (Mexico); "Neurochemical mechanisms of temperature regulation and food ingestion," Robert D. Myers; "Increased protein synthesis in nerve end terminals during the development of amygdala kindled convulsions," Víctor Alemán (Mexico); "Central neural transmitters and aggressive behavior," Donald J. Reis (United States); "Chemistry of reward and punishment," Larry Stein (United States); "Regulation of information processing in the hippocampus by K^+ release and $(K^+)_0$ accumulation," Ivan Izquierdo (Argentina).

27 June. 9:00 a.m. "Neurohumoral Mechanisms in Behavioral Regulation." Chairman: Geoffrey Hall (England). "Modulatory effects of acetylcholine and catecholamines in the caudate nucleus during motor conditioning," Hector Brust-Carmona (Mexico); "The effects of drugs and electrical stimulation of the brain on memory storage processes," James L. McGaugh (United States); "Chemical coding of sleep with special reference to the sleep factor delta," Marcel Monnier (Switzerland); "The possible nature of the sleep-inducing brain perfusates: Its relationship to seizure inhibition," René Raúl Drucker-Colín; "5-Hydroxyindoleacetic



acid in cerebrospinal fluid during wakefulness, sleep and electrical stimulation of the raphe system," Miodrag Radulovacki (United States); "Possible role of melatonin in sleep processes," Augusto Fernández-Guardiola (Mexico); "Interactions of amine systems in the central nervous system in the regulation of the states of vigilance," Peter Morgane (United States).

3:00 p.m. "Neurohumoral Factors and Mental Disorders." Chairman: A. Gómez-Puyou. "Comparative studies of urinary bufotenin in control and in chronic schizophrenic patients free of drugs: Gas chromatography-mass spectrometric identification," Harold E. Himwich (United States); "Phenylethylamine: Possible role in depression and antidepressive drug action," Hector Sabelli (United States); "Neurochemical and neuroendocrine aspects of sleep: Relationship to sleep disorders and to medical illness," Roger J. Broughton (Canada); "The chemical coding via the cholinergic system: Its organization and behavioral implications," Alexander G. Karczmar (United States); "A model of the vertebrate nervous system based largely on disinhibition: A key role of the GABA system," Eugene Roberts (United States).

Sociolinguistics and Language Planning

Arranged by Yolanda Lastra de Suárez (Mexico) and Wolfgang Wölck (United States).

27 June. 9:00 a.m. Chairman: Wigberto Jiménez Moreno (Mexico). "Linguistics as a resource in language planning," Paul Garvin (United States); "Multilingualism and its social context," speaker to be announced (Peru); "From monolingualism to bilingualism: Educational planning in indigenous areas," Gloria Ruiz de Bravo Ahuja

(Mexico); panel discussion and questions from the floor. Discussants: Doris Bartholomew (Mexico), Alfonso Villa Rojas (Mexico), Leonardo Manrique (Mexico), Norman McQuown (United States), Rudolph Troike (United States).

3:00 p.m. Chairman: Juan M. Lope Blanch (Mexico). "Bolivian languages, schools, and radios," Xavier Albo (Bolivia); "Sociolinguistic problems in teaching Spanish to speakers of indigenous languages in Oaxaca," Giorgio Perissinotto (Mexico and United States); "The development of Navajo bilingual education," Bernard Spolsky (United States); "The dictionary of Mexican Spanish: Progress report," Luis Fernando Lara (Mexico). Panel discussion and questions from the floor.

28 June. 9:00 a.m. Chairman: Gonzalo Rubio Orbe (Mexico). "Language standardization and language planning," Joan Rubin (United States); "The relativity of bilingualism and its social realization," José Pedro Rona (Canada); "Cognitive and attitudinal consequences of elementary education in a second language: A Canadian experiment," Wallace Lambert (Canada); "Implications of language learning theory for language planning," Christina Bratt Paulson (United States). Panel discussion and questions from the floor.

3:00 p.m. Chairman: Juan Comas (Mexico). "Sociolinguistics and educational planning in the U.S.," Roger Shuy (United States); "Language planning and the relation between language and social history in the Caribbean," Mervyn Alleyne (Jamaica); "Bilingual education in Mexico: Theoretical and practical aspects," Juan José Rendón (Mexico). Panel discussion and questions from the floor.

29 June. 9:00 a.m. Evaluation and digest. Open discussion among symposium speakers, panelists, and attendants.

Psychodysleptics and Addiction

Arranged by Wallace L. Guess (United States) and Oscar Domínguez Vargas (Mexico).

28 June. 9:00 a.m. "Psychodysleptics." Cochairmen: E. A. Carlini (Brazil) and José Carranza-Acevedo (Mexico). Introduction to session, José Carranza-Acevedo; "Botany of *Cannabis sativa*," Maynard W. Quimby (United States); "Chemical analysis of *Cannabis sativa* of distinct origin," Carlton E. Turner (United States);

"Metabolism of cannabis in man," Solomon H. Snyder (United States); "Aggressiveness caused by cannabis," E. A. Carlini; "Cannabis as a psychodysleptic," José Carranza-Acevedo; "Enzymatic changes caused by cannabis," Bertha G. Ortega (Mexico); discussions of papers.

3:00 p.m. "Addiction to Narcotics." Cochairmen: Harold T. Conrad (United States) and Uriel Estrada Robles (Mexico). Introduction to session, Uriel Estrada Robles; "Pharmacological adjuncts in the treatment of opiate dependents," Richard B. Resnick (United States); "Analgesic properties of narcotic antagonists," Rodolfo Rodríguez Carranza (Mexico); "Narcotic antagonists and physical dependence," Julián Villarreal (Mexico); "Self-administration and drug dependence," Uriel Estrada Robles; "Hospital treatment



and rehabilitation," Harold T. Conrad; discussion of papers.

29 June. 9:00 a.m. "Marihuana." Cochairmen: Solomon H. Snyder and José Carranza-Acevedo. Introduction to session, José Carranza-Acevedo; "Marihuana from different parts of the world," Maynard W. Quimby; "Active substances of marihuana," Carlton E. Turner; "Aggressive behavior due to marihuana," E. A. Carlini; "Marihuana in relation to other drugs," Harold T. Conrad; "Marihuana and brain damage," José Carranza-Acevedo; "Marihuana and individual damage," Ramón de la Fuente; "Social damage and marihuana," Solomon H. Snyder; discussion of papers.

3:00 p.m. "Pharmaceutical Education in the Americas." Cochairmen: Ernesto Domínguez (Mexico) and John Autian (United States). Introduction to session, Wallace L. Guess; "Pharmaceutical education at UNAM," José F. Herrán (Mexico); "Pharmaceutical education at IPN," Ernesto Fabela (Mexico); "Pharmaceutical education pro-

grams in Canada," Allan M. Goodeve (Canada); "Pharmaceutical education program in the United States," Laurence C. Weaver (United States); "Pharmaceutical education with an industrial orientation," Aquiles Arancibia (Chile).

Anthropology Applied to Health Programs

Arranged by Arthur Rubel (United States) and Luis Alberto Vargas (Mexico).

29 June. 9:00 a.m. Chairman: Luis Alberto Vargas. "Use of infant growth patterns based on long-term studies of healthy children," Johanna Faulhaber (Mexico); "Social tasks that affect the growth of children in Oaxaca," Robert M. Malina (United States); "Application of paleopathological studies to modern medicine," Carlos Serrano (Mexico); "Application of somatotype studies to preventive medicine," Luis Alberto Vargas.

3:00 p.m. Chairman: Arthur Rubel. "Problems of the confrontation of the Western medical system with local practice," Horacio Fabrega (United States); "The role of women in the introduction of supplementary food," Sally Nerlove (United States); title to be announced, Eleanor Carroll (United States); "The meaning of soul loss illness," Carl W. O'Neill (United States) and Arthur Rubel.

30 June. 9:00 a.m. Chairman: Rolando Collado (Mexico). A joint study will be presented by the Grupo de Antropología Médica and some Mexican public health institutions on the actual and potential uses of anthropology in Mexican health programs.

3:00 p.m. Chairman: Alfredo López Austin (Mexico); discussion.

Health and Illness, Birth and Death: The Cultural Context for Bio-Medical Intervention

Arranged by Daniel Callahan (United States) and Ramón de la Fuente (Mexico).

29 June. 9:00 a.m. Chairman: Ramón de la Fuente. "Health and illness in technological societies," David Mechanic (United States); "Health and illness in transitional societies," Antonio Ordóñez-Plaja (Colombia).

3:00 p.m. Chairman: Daniel Callahan. "Health and illness in primitive

societies," Stanley Diamond (United States). Panel discussion: Renee C. Fox (United States), Carlos Gual (Mexico), Amitai Etzioni (United States), and Robert Q. Marston (United States).

30 June. 9:00 a.m. Chairman: Carlos Gual. "Changing attitudes toward birth and children in Mexico," Pablo Pindas (Mexico); "Children and family in the United States," Robert Coles (United States); "Attitudes toward the defective newborn," John Fletcher (United States). Panel discussion: Rafael Velasco Fernández (Mexico), Robert Michels (United States), and Robert Murray (United States).

3:00 p.m. Chairman: Willard Gaylin (United States). "Care of terminal patients in the United States," Eric Caswell (United States); "Octavio Paz' use of the symbol of death as a key to the Mexican family," Emir Rodríguez Monegal (United States); "The use of technology to prolong life: Some mental hygiene issues," Luis Weinstein (Chile). Panel discussion: William F. May (United States), Ramon Parres (Mexico), Alfonso Millán (Mexico), and Manuel Quijano (Mexico).

Family Planning

Arranged by Carlos Campillo Saenz (Mexico) and Benjamin Viel (United States).

29 and 30 June. Topics in economic, social, and medical implications; progress in birth control and intrauterine devices; progesterone liberation systems; family planning and responsible paternity; and so forth.

Detailed listing of topics and speakers will be published at a later date.

Aerobiology of Diseases, Pests, and Allergens in the Western Hemisphere

Arranged by Lucas Calpouzos (United States) and Armando Campos (Mexico).

2 July. 9:00 a.m. "The Aerobiology of Plant Diseases and Pests." Chairman: Robert L. Edmunds (United States). "Aerobiology in the Western Hemisphere," Robert L. Edmunds; "Aerial transport of peanut rust spores," Eugene P. Van Arsdell (United States); "Aerial transport of coffee rust spores in Brazil," Joao A. Martínez (Brazil); "The aerobiology of wheat rusts in the Western Hemisphere," S. Rajaram (Mexico);



"The aerobiology of pests in the Western Hemisphere," Michael D. Attkins (United States).

3:00 p.m. "The Aerobiology of Allergens." Chairman: William R. Solomon (United States). "Volumetric methods in the study of exposure of fungus spores," William R. Solomon; "Allergic problems associated with the coffee and castor bean industries," Annelise Strauss (Brazil); "Airborne allergens in a tropical locale," Carlos Benaim-Pinto (Venezuela); "Aspects of hypersensitivity pneumonitis," John E. Salvaggio (United States).

3 July. 9:00 a.m. "Aerobiology of Animal and Human Diseases." Co-chairmen: Pedro Acha (United States) and Hank L. Stoddard (United States). "Air and the transmission of foot and mouth disease," Mario Fernández (Brazil); "Macromolecular events in airborne infectious microorganisms," M. T. Hatch (United States); "Health events of airborne pesticide particulates on non-target population," R. J. Heckly and M. A. Chatigny (United States); "Remote sensing for monitoring aerobiological phenomena in human and animal health," Alejandro Thierman and Charles M. Barnes (United States); "Comparison of parenteral and aerosol routes of administration of influenza vaccines and viruses," Jerry S. Walker (United States).

Health Services

Arranged by Luis Castelazo Ayala (Mexico), Charles D. Flagle (United States), and Jorge Ortiz (United States).

2 July. 9:00 a.m. "Operational Aspects of Health Services." Chairman: Charles D. Flagle. "Needs for operational research in health services," Leonardo Bravo (United States) and Gon-

zalo Mitre (Mexico); "Technological innovation in health services," Richard K. C. Hsieh (United States); "Program evaluation and review in health services," Jorge Ortiz and Andres de Witt Greene (Mexico); "Coordination of medical services," Rafael Senties V. (Mexico) and Gastón Novelo (Mexico); discussion.

3:00 p.m. "Planning of Health Services." Chairman: Jorge Ortiz. "The evolution of health planning models," Charles D. Flagle and Carlos García Álvarez (Mexico); "Mortality related to socio-economic indicators," Rodger D. Parker (United States) and Roberto Robles Garnica (Mexico); "Health planning in developing nations," Richard D. Smallwood (United States) and Renaldo Guzmán Orozco (Mexico); "Training for health systems analysts," Harold Smalley (United States); "Social security institutions in the national health service," Luis Castelazo Ayala.

3 July. 9:00 a.m. Group discussion. Chairman: Luis Castelazo Ayala.

Environmental Health in the Americas

Arranged by Arend Bouhuys (United States), Luis Cañedo (Mexico), and Alberto Hurtado (Peru).

3 July. 9:00 a.m. "Man in the Environment." Chairman: Arend Bouhuys. "Man at high altitude," Alberto Hurtado; "Physiological mechanisms of adaptation to cold," Oliver Héroux (Canada); "Work in hot climates," N. B. Strydom (Republic of South Africa); "Air pollution," Sheldon K. Friedlander (United States). Panel discussions; additional participants: Hugo Donoso (Chile), R. Lefrancois (France), Lawrence A. Plumlee (United States), Jan A. J. Stolwijk (United States), and Nelson Nefussi (Brazil).

3:00 p.m. "Environmental Lung Disease." Chairman: Alberto Hurtado. "Relationship between tobacco smoking and pulmonary disease in the Caribbean," George J. Miller (United Kingdom); "Health hazards of asbestos inhalation in industry," Hernan Oyanguren M. (Chile); "Lung disease in steel workers," Santiago F. Bó (Argentina); "Environmental lung disease in cotton and hemp workers," Vicente López Merino (Spain). Panel discussion; additional participants: Arend Bouhuys, Ricardo Haddad (Peru), Blanca R. Ordonez (Mexico), and John M. Peters (United States).

4 July. 9:00 a.m. "Epidemiology and Health Care." Chairman: Abraham Horwitz (United States). "First epidemiological survey of Chagas' disease in Bolivia," Richard D. Stewart (United States); "Exposures to inhalants in the home," Eugenija Zuskin (Yugoslavia); "Rural health care in Mexico," Luis Cañedo; "The new epidemiology," Arend Bouhuys. Panel discussion; additional participants: Douglas H. K. Lee (United States), Roberto Weber (Brazil), and Reuel A. Stallones (United States).

3:00 p.m. "Approaches to Solutions." Chairman: Luis Cañedo. "Manpower for environmental health programs," Reuel A. Stallones; "Autopharmacology in relation to environmental health," Mauricio Rocha e Silva (Brazil); "Education of environmental health professionals," William T. Jones (England); "Engineering solutions to environmental health problems," Walter Engracia Oliveira (Brazil). Panel discussion; additional participants: Douglas H. K. Lee, Gustavo Rivas Mijares (Venezuela), and Max J. Miller (United States).

Behavior and Violence

Arranged by Berenice A. Carroll (United States), Santiago Genovés (Mexico), and John P. Scott (United States).

4 July. 9:00 a.m. "Biological Sources of Violence." Chairman: Santiago Genovés. "Genetic factors in aggression," Benson Ginsburg (United States); "Hormones and fighting," Frank H. Bronson (United States); "Human emotional behavior induced by deep electrical brain stimulation," Augusto Fernández (Mexico); "Surgical and psychological treatment of excessive violence," Karl Pribram (United States); "Cultural vs. biological evolution of violent behavior," Ralph Holloway (United States).

3:00 p.m. "Development of Violent Behavior and Institutional Causes of Violence." Chairman: J. P. Scott. "The influence of violence on child behavior," Jorge M. Velasco (Mexico); "Television violence: An examination one year after

the Surgeon General's report," Eli Rubenstein (United States); "Children's coping with violence," Rogelio Díaz Guerrero (Mexico); "The subcultures of violence and social class as determinants of interpersonal violence," Sandra Ball Rokeach (United States); "Institutional violence," John Saxe-Fernández (Mexico); "Biology and law, with special reference to violence," R. Tamayo, D. Pantoja, and R. González (Mexico); conclusion and summary, J. P. Scott.

Additional speakers and topics are scheduled for the afternoon of 2 and 3 July.

RESOURCES—ENERGY —PHYSICAL SCIENCES

Symmetry in Nature

Arranged by Marcos Moshinsky (Mexico).

20 June. 3:00 p.m. "Concepts of symmetry," E. P. Wigner (United States); "Symmetry and cosmology," J. A. Wheeler (United States); "Symmetry and elementary particles," C. N. Yang (United States).

21 June. 9:00 a.m. "Symmetry in condensed matter," P. G. de Gennes (France); "Symmetry in chemistry," S. A. Matsen (United States); "Symmetry in biology," Dorothy Hodgkins (Great Britain).

Archaeoastronomy in Pre-Columbian America

Arranged by Anthony F. Aveni (United States) and Horst Hartung (Mexico).

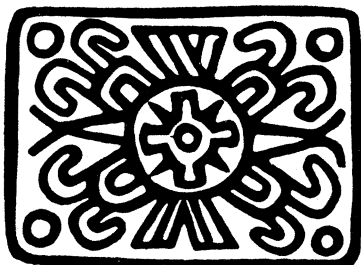
20 June. 9:00 a.m. Chairman: Anthony F. Aveni. "Mesoamerican ethnoastronomy," Michael D. Coe (United States); "The astronomical record in Chaco Canyon, New Mexico, U.S.A.," R. A. Williamson, A. F. Williamson, H. J. Fisher, and C. Cochran (United States); "The Pueblo sun-moon-star calendar in the southwestern United States (United States); "American Indian interest in the sky indicated in legend, rock art, ceremonial and modern art," Von Del Chamberlain (United States); "Early Navajo astronomical pictographs in Canyon de Chelly, northeastern Arizona, U.S.A.," Claude Britt, Jr. (United States); "An Astronomical interpretation of the four ball-



court panels at Tajin, Mexico," Carmen Cook de Leonard (Mexico); "An hypothesis on astronomical observations in ancient Mesoamerica," Marion P. Hatch (United States).

21 June. 9:00 a.m. Chairman: Horst Hartung. "Astro-archaeology—the unwritten evidence," Gerald S. Hawkins (England); "Factors affecting the arrangement of Mesoamerican ceremonial centers with particular reference to astroarchaeology and magneto-archaeology," Robert Fuson (United States); Possible astronomical orientation of structures in central Mexico, Oaxaca and Yucatan," Anthony F. Aveni; "Palenque, Chiapas, Mexico: Analysis and program of an archaeological plaza recreating its cultural environment in terms of astronomical space time," Alfonso Hurtado Serrano (Mexico); "The spectrum of time in Mesoamerica, A.D. 400–1500," Derek J. Schove (England); "The method of defining possible reflections of astronomical observations in the pre-Columbian architecture of Mesoamerica," Horst Hartung; "The shortest day of the year at Teotihuacan," R. David Drucker (United States); "Cognitive analysis of an arithmetic calendric Olmec mosaic c. 1200 B.C.," Alexander Marshack (United States).

22 June. 9:00 a.m. Chairman: Robert Fuson. "Did the Mayans record comet and nova events?," Hubert E. Harber (United States); "Astronomical implications of the Maya agricultural calendar," Harold R. Shaw (Canal Zone); "An astronomical test for Ahua equations," Franz J. Hochleitner (Brazil); "A comparison of the sighting schemes used by Old World (pre-Columbian) cultures," Thaddeus Cowan (United States); "Symbolism of the chronological-astronomical expression of the Aztecs," Raúl Noriega (Mexico); "An attempt to interpret the astronomical meaning of the '10 pictured' intervals in the Dresden codex eclipse table using Makemson's correlation number," Nan Owen (United States); "Possible rock art records of Crab Nebula supernova in the western United States," R. A. Williamson; "The nature and nurture of archaeoastronomical studies," Jonathan Reyman (United States); "Mesoamerican archaeoastronomy so far," Elizabeth C. Baity (United States).



Geodynamics

Arranged by Cinna Lomnitz (Mexico) and C. L. Drake (United States).

20 June. 3:00 p.m. "Regional Problems." Chairman: Fernando de Almeida (Brazil). Invited papers: Pacific, Cocos, and Nasca Plate and their interactions with the American continent. Problems of continental drift may also be considered.

21 June. 9:00 a.m. "Regional Problems." Chairman: Fernando de Almeida. Round-table discussion.

3:00 p.m. "Driving Mechanisms of Sea-Floor Spreading." Chairman: David C. Tozer (United States). Invited papers.

22 June. 9:00 a.m. "Driving Mechanisms of Sea-Floor Spreading." Chairman: David C. Tozer. Round-table discussion.

3:00 p.m. "Geodynamic Fields." Chairman: George P. Woollard (United States). Invited papers: Recent results on magnetic, gravity, seismic, and heat flow surveys of the American continent and adjoining oceanic areas.

23 June. 9:00 a.m. "Geodynamic Fields." Chairman: George P. Woollard. Round-table discussion.

24 June. Field trip and picnic lunch.

Aerial Inventory of National Resources

Arranged by Joseph P. Burns (United States) and J. Alberto Villasana L. (Mexico).

21 June. 3:00 p.m. "Importance of National Resources Inventories." Chairman: Juan B. Puig (Mexico). "Mexico's national inventory program," Juan B. Puig (Mexico); "The use of color aerial photography," speaker to be announced; "Integrated surveys, advantages and disadvantages," Luis I. Miranda (Mexico); "Photogrammetry, a tool for resource inventory," Angel García Amaro (Mexico).

22 June. 9:00 a.m. "Land Use and Land Inventories." Chairman: Arthur J. McNair (United States). "Earth resources inventory of Amazon Valley," Otto B. Netto (Brazil); "Potential land use prediction," Jorge F. Vaca (Mexico); "Operational use of remote sensing in Arizona," Carl C. Winnika (United States) and Herbert H. Schumann (United States); "Land inventory systems," Ronald L. Shelton (United States) and Ta Liang (United States).

3:00 p.m. "National Inventory Programs in Latin America." Chairman: Hans G. Ruthe (Panama). "Latest de-



velopments in orthophotography," Teodor J. Blachut (Canada); "Rural cadaster in El Salvador," José Ma. González (El Salvador); "Rural cadaster and land registration," speaker from Honduras to be announced.

23 June. 9:00 a.m. "Earth Resources Orbiting Satellite Program." Chairman: William A. Fischer (United States); "Mapping from aircraft and earth resources technology satellite (ERTS-1)," Alden P. Colvocoresses (United States); "Remote sensing in Mexico," Raúl Higuera Mota (Mexico); "Preliminary results of analysis of ERTS imagery in Argentina," Eduardo Jorge Methol (Argentina); "Hydrogeologic data revealed by ERTS-1 imagery, central Andes, South America," George E. Stoertz (United States).

Volcanism in Mexico and Central America

Arranged by Robert Decker (United States), Federico Mooser (Mexico), and Richard Stoiber (United States).

21 June. 3:00 p.m. "Forecasting Volcanic Eruptions." Chairman: Rodrigo Sáenz (Costa Rica). "State-of-the-art of volcano forecasting," Robert Decker; "Volcano forecasting in Costa Rica," Rodrigo Sáenz; "Volcanic prediction in Central Mexico," Cervando de la Cruz (Mexico); "Earth satellite volcano warning stations in Central America," Peter Ward (United States); "Relationship of earthquakes and volcanism in Middle America," Michael Carr (United States).

22 June. 9:00 a.m. "Explosive Volcanism." Chairman: Samuel Bonis (Guatemala). "Volcanic gases from Central American volcanoes," Richard Stoiber; "Volcanic ash from Central

American volcanoes," William Rose, Jr. (United States); "The eruption of Arenal Volcano, Costa Rica," William Melson (United States); "What we know and don't know about explosive volcanic eruptions," Alexander McBirney (United States); "Explosive volcanism in Guatemala," Samuel Bonis. "Films of the eruption of Pacaya Volcano, Guatemala," Alfredo MacKenney (Guatemala).

3:00 p.m. "Geothermal Power." Chairman: Federico Mooser. "Geothermal power," Geoffrey Robson (United States); "Geothermal power in Mexico," H. Alonso Espinoza (Mexico) and Federico Mooser; "Geothermal power in the Imperial Valley," Robert Rex (United States); "Geology of the Cerro Prieto geothermal field, Mexico," Arturo González (Mexico); "The Ahuachapan geothermal field, El Salvador," Alberto Vides (El Salvador).

23 June. 9:00 a.m. "Future Volcanological Research in Mexico and Central America." Chairman: Richard Stoiber. Panel discussion.

Hurricanes

Arranged by Julian Adem (Mexico) and Louis J. Battan (United States).

22 June. 3:00 p.m. Chairman: Louis J. Battan. "The importance of the inflow angle in the development of hurricanes," Sergio Serra Castelán (Mexico); "The tropical boundary layer and hurricane formation," Michael Garstang (United States); "Anticyclone circulation and its contribution to the development of hurricanes," Mario Rodríguez Ramírez (Cuba); "Numerical modeling of hurricanes," Stanley Rosenthal (United States).

23 June. 9:00 a.m. Chairman: Pedro Mosino (Mexico). "Hurricane prediction," Robert H. Simpson (United States); "General circulation in the tropics and its relationship with hurricanes," Hector Grandoso (Costa Rica); "Modification of hurricanes," Cecil Gentry (United States); "The effect of tropical storms and hurricanes in Central America," Leopoldo Reyes Rivera (El Salvador).

Land Connections between North and South America

Arranged by Gabriel Dengo (Guatemala) and Ismael Ferrusquía (Mexico).

3 July. 3:00 p.m. Chairman: Frank

C. Whitmore, Jr. (United States), "Tectonic framework of Central America: A statement of the problem of land connections between North and South America," Gabriel Dengo; "Geological and geophysical investigations in the Cocos plate as related to the origin of southern Central America," Bruce T. Malfait (United States); "Geophysical investigations bearing on the problem of land connection between North and South America," James E. Case (United States); "Geology of Panama," Daniele del Giudice (Guatemala); "Geology of southern Mexico," Jorge González-Alvarado (Mexico).



4 July. 9:00 a.m. Chairman: Ismael Ferrusquía. "Distribution of late Cretaceous marine faunas, southern Mexico and northern Central America," Gloria Alencaster (Mexico); "Distribution of Tertiary and Quaternary marine faunas in Mexico and northern Central America," Carmen Perrilliat (Mexico); "Distribution of Tertiary marine molluscan faunas in southern Central America and northern South America," Wendell P. Woodring (United States); "Distribution of Tertiary equinoderms in southern Mexico and Central America," Blanca Buitrón (Mexico); "Distribution of Tertiary and Quaternary ostracoda in Central America," W. Van Den Bold (United States).

3:00 p.m. Chairman: Gabriel Dengo. "Evolution of freshwater fish faunas in southern Mexico and Central America," José Álvarez del Villar (Mexico); "Distribution of Cenozoic vertebrate faunas in Mesoamerica and problems of migration between North America and South America," Ismael Ferrusquía; "Distribution and migration of Cenozoic floras in Mesoamerica," Alan Graham (United States); "Plate tectonic theory as related to Central America," Otto Bohnenberger (Guatemala); summary and conclusions, Gabriel Dengo and Ismael Ferrusquía.

ENVIRONMENT—THE BIOLOGICAL SCIENCES

Research in Natural Products

Arranged by Xorge Alejandro Domínguez (Mexico) and Thomas E. Taylor (United States).

25 and 26 June. Detailed listing of topics and speakers will be published at a later date.

Wildlife and Its Environments in the Americas

Arranged by Rollin H. Baker (United States) and Bernardo Villa Ramírez (Mexico).

25 June. 9:00 a.m. "Shared Wildlife Resources—Problems and Solutions." Chairman: Rollin H. Baker. "Migratory waterfowl—a hemispheric perspective," Milton W. Weller (United States); "Felids of Latin America—importance and future prospects," Carl B. Koford (United States); "Ecology and distribution of the tinamous and Neotropical Galliformes," Douglas A. Lancaster (United States); "Latin American cervids—present and future status," Fernando Días de Avila Pires (Brazil); discussion leader: Bernardo Villa Ramírez. "Introductions—Some Evaluations." Chairman: Fiacro Martínez Martínez (Mexico). "Introduction of aquatic species into Mexico and Latin America," Jorge Cabrera Jimenez (Mexico); "Exotic ungulates—present inventory and future guidelines," George A. Petrides (United States).

3:00 p.m. "National Parks—Concepts and Prospects." Chairman: Enrique Beltran (Mexico). "National parks in Mexico," José Arreola Tinoco (Mexico); "National parks in Middle America," Jorge Jiménez Jiménez (Costa Rica); "National parks in South America," Italo N. Costantino (Argentina);



"National parks in the Caribbean area," Edward L. Towle (St. Thomas, United States Virgin Islands); discussion leader: Robert O. Lee (United States).

Tropical Ecosystems

Arranged by Arturo Gómez-Pompa (Mexico) and Charles R. Malone (United States).

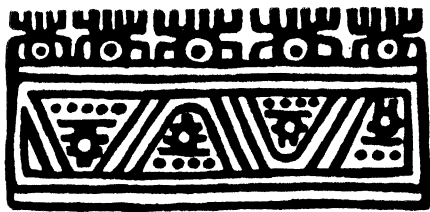
29 June. 9:00 a.m. Chairman: Arturo Gómez-Pompa (Mexico). "Reproductive methods of tropical lowland forest trees," Kamaljit Bawa (United States); "Relationship of basic and applied entomology in the humid tropics," Daniel H. Janzen (United States); "The storage of fertility elements in soil and vegetation as influenced by shifting cultivation," Paul Zinke (United States).

3:00 p.m. Chairman: Arturo Gómez-Pompa. "Biotic interactions in the tropical lowlands," Robert K. Colwell (United States); "The evolutionary importance of pollinator behavior in tropical pollination systems," Gordon Frankie (United States); "Mangrove forests: A physiological approach," Federico Panier (Venezuela); "An analysis of the system of slash-burn agriculture," Efraín Hernández X. (Mexico).

30 June. 9:00 a.m. Chairman: Arturo Gómez-Pompa; "'El Ejido' and the tropical rain forest: An ecological and social contradiction," Víctor Toledo (Mexico); "The use of the rain forest from the forestry point of view," Ramón Echenique (Mexico); "Seed viability and dormancy of a tropical evergreen rain forest," Patricia Moreno (Mexico); "Study on the regeneration of high evergreen rain forests in Veracruz, Mexico," Arturo Gómez-Pompa and C. Vázquez (Mexico).

3:00 p.m. "Conservational Use of the Rain Forests: An Impossible Goal?" Chairman: Arturo Gómez-Pompa. Discussion: Participants and others.





Some Mathematical Questions in Biology

Arranged by Jack D. Cowan (United States) and José Negrete Martínez (Mexico).

30 June. 9:00 a.m. Chairman: Jack D. Cowan. Title to be announced, Lewis Wolpert (England); "The control of development," Anthony D. J. Robertson (United States); "A mathematical model in cellular biology," Stephen Smale (United States); "Principles of vertebrate embryology," René Thom (France).

3:00 p.m. Chairman: José Negrete Martínez. "The competition exclusion principle: How similar can coexisting species be?," Robert May (United States); "A theory for cooperative activity in nervous tissue," Jack D. Cowan; "Computer languages relating to biological theories," Seymour Papert (United States); "Mathematical education for life scientists." Panel discussion, José Negrete Martínez.

Science and Technology of Range Management in the Socio-Economic Development of the American Continent

Arranged by Martín H. González (Mexico) and Harold F. Heady (United States).

30 June. 9:00 a.m. Introduction, Harold Heady. "Ecology and cattle raising in the semidesert of Patagonia, Argentina," Jorge M. Brun (Argentina);



"The potential and use of the high Andean ranges in relation to the Andean economy," Mariano Segura B. (Peru); "Range management and livestock production in South America," J. J. Norris (Italy). Comments: Gerald W. Thomas (United States), Manuel Casas (Mexico), Lorenzo J. Maldonado (Mexico), and Joseph L. Schuster (United States).

3:00 p.m. "Development in range management research in Mexico and its impact on cattle production," Martín H. González; "The national program of range improvement in the state of Zacatecas—technical and social aspects," Pedro Ruiz Gonzalez (Mexico); "The impact of education and range management research on the development of the Americas," Thadís W. Box (United States). Comments: Jorge A. del Aguila (Mexico), Francis T. Colbert (United States), and Pedro Solana (Mexico). "Evaluation of the findings of the meeting," Harold Heady.

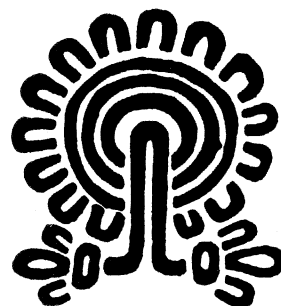
Aquaculture in the Americas

Arranged by Oswald A. Roels (United States), John Ryther (United States), and Henry J. Schafer (Mexico).

2 July. 9:00 a.m. Chairman: Oswald A. Roels. "Seaweed mariculture," Arthur C. Mathieson (United States); "The culture of the mussel *Perna perna* and the mangrove oyster *Crassostrea rhizophorae* in Venezuela," Enrique Mandelli (Venezuela); "Cage culture of scallops," Michael Castagna (United States); "Crustacean aquaculture in Middle America," Harold H. Webber (United States). Panel discussion; leader: Henry Schafer; panel members: Arthur C. Mathieson, Enrique Mandelli, Michael Castagna, Harold H. Webber, and Oswald A. Roels.

12:30 p.m. Luncheon address: "The potential contribution of aquaculture to the development of the Americas," B. Quintana (Mexico).

3:00 p.m. Chairman: Henry J. Schafer. "Institutional constraints to the development of aquaculture," Fernando Fournier (Costa Rica) and Burton A. Landy (United States); "Salmon cage culture," Anthony Novotny (United States); "The economics of aquaculture in the Americas," Simon Williams (Mexico). Panel discussion; leader: John Ryther; panel members: Fernando Fournier, Burton A. Landy, Anthony Novotny, Simon Williams, and Oswald A. Roels.



Human Dwellings: The Problems of Today, the Solutions of the Future

Arranged by Donald Conway (United States), Aristide H. Esser (United States), and Roberto Eibenschutz (Mexico).

2 July. 9:00 a.m. "The Process of Urban Settlements." Speakers: Roberto Eibenschutz (Mexico); Donald Hanson (United States), Guadalupe Rivera de Marin (Mexico), Luis Unikel (Mexico), Samuel A. Sloan (United States), and Aristide H. Esser (United States).

3:00 p.m. "Urban Structure: Space, Land Use and Transportation." Speakers: Rubén Darío Utría (Chile); Thomas Callaway (United States), Julio García Coll (Mexico), Guillermo Cortés Melo (Mexico), Fernández Sepulveda (Mexico), Donald Grant (United States), and Edwin Willems (United States).

3 July. 9:00 a.m. "The Legal and Institutional Problems." Speakers: Jorge Hardoy (Argentina); Stuart Sanders (United States), Andrés Alarcón Segovia (Mexico), Daniel Vásquez (Mexico), Joaquín Alvarez (Mexico), and Amos Rapaport (United States).

3:00 p.m. "Housing." Speakers: José Ma. Gutiérrez (Mexico), Mauricio Knobel (Argentina), Rubenz Vaz da Costa (Brazil), Estefanía Chávez de Ortega (Mexico), Michel Autochin (Mexico), Don Conway (United States), and Alton J. De Long (United States).

Development of Arid Lands

Arranged by Braulio Fernández Aguirre (Mexico) and Warren Hall (United States).

3 and 4 July. Topics in living conditions, population distribution, natural resources, water inventory, agriculture, livestock, and so forth.

Detailed listing of topics and speakers will be published at a later date.

TECHNOLOGY

Transfer of Technology

Arranged by Jordan Baruch (United States) and Miguel S. Wionczek (Mexico).

20 June. 3:00 p.m. "Economic Impact of Technological Change." (a) "In developed countries," Anne Carter (United States); (b) "In less developed countries," Jorge A. Katz (Argentina); commentators: José Campillo Sainz (Mexico), Alejandro Nadal (Mexico), and Jack Baranson (United States).

21 June. 9:00 a.m. "Social Impact of Current Rate of Technological Change." (a) "In developed countries," speaker to be announced; (b) "In less developed countries," speaker to be announced; commentators: Francisco Sagasti (Peru), Mauricio de María y Campos (Mexico), and James Meecham (United States).

3:00 p.m. "Current Vehicles of Technological Trade—I"; (a) "Transactions in multinational companies," Robert B. Staubaugh (United States); commentators: Ronald Müller (United States) and David Ben Daniel (United States); (b) "Imports of capital goods," Krishna R. Singh (India); commentators: to be announced; Gerardo Bueno (Mexico).

Canceled Symposia

Previously announced symposia on "Nuclear Energy Applications and Resources," on "Problems and Perspectives of Rural Industrialization" and on "Interstellar Matter" have been cancelled.

22 June. 9:00 a.m. "Current Vehicles of Technological Trade—II"; (a) "The international patent system," Mark S. Massel (United States); commentators: Constantino Vaitos (Peru) and Thomaz Thedim Lobo (Brazil); (b) "Licensing and technical support," Enrique Aguilar (Mexico); commentators: Marcus Finnegan (United States) and Carlos Bazdrich (Mexico).

3:00 p.m. "Determinants of Technological Policy—I"; (a) "The educational system," K. Kojima (Japan); commentators: to be announced; Rodrigo Medellín (Mexico); (b) "Entrepreneurial development," Gerardo Bueno; commentators: Helio Jaguaribe (Brazil), Alan Frohman (United States), and Máximo Halty Carrere (United States).

23 June. 9:00 a.m. "Determinants of

Technological Policy—II"; (a) "Structure of the private sector," Carlos Bazdrich (Mexico); commentators: Jorge Babato (Argentina) and Michael Michaelis (United States); (b) "Governmental actions—experiences of the Andean group," Constantino Vaitos (Peru); commentators: Luisa María Leal (Mexico).

Information Requirements for Innovation in Industry

Arranged by Scott Adams (United States) and Guillermo Fernández de la Garca (Mexico).

25 June. 9:00 a.m. Chairman: Guillermo Fernández de la Garca: Introduction, "Opportunities for new solutions to old problems," Scott Adams; "Information for industrial innovation: The Mexican experience," José Ignacio Bolívar (Mexico); "Information programs for technology transfer: The United States," Robert D. Shriner (United States); "Model information systems for industrial innovation," David Liston (United States); discussion.

3:00 p.m. Chairman: Scott Adams. "Information systems for industrial innovation: Practical problems," Angela Pompeu (Brazil) and José Quevedo (Mexico); "Information systems for industrial innovation: Case studies," José Giral B. (Mexico) and María Angélica Moreno (Chile); discussion; "Use of patent information in industry: Some Mexican experiences," María del Carmen Alvarado (Mexico); summary and conclusions, Guillermo Fernández de la Garca.

Summaries of Mexico City Meeting Symposia

Summaries of symposia to be presented at "SCIENCE AND MAN IN THE AMERICAS" have appeared in the following issues of *Science*: 2 March, "Problems of Population," "Wildlife and Its Environments in the Americas," "Impact of Range Science in the Americas"; 9 March, "The Sea and Its Resources," "Hurricanes," "Environmental Health in the Americas"; 16 March, "Earthquakes and Earthquake Engineering," "Geodynamics," "Volcanism in Mexico and Central America," "Archaeoastronomy in Pre-Columbian America," 23 March, "Opportunities in Education for Development," "Sociolinguistics and Language Planning," "Educational Planning," "Health and Illness, Birth and Death"; 30 March, "Science, Development, and Human Values," "Health Services," "Neurohumoral Coding of Brain Function," "Behavior and Violence"; 6 April, "Nutrition and New Food Technology," "Effects of Malnutrition on Human Development," "Drug Addiction," "Natural Products"; 13 April, "Deserts and Arid Lands," "Tropical Ecosystems"; 20 April, "Nonnuclear Energy for Development," "Transfer of Technology and National Economic Development," "Aerial Inventory of National Resources"; 27 April, "Earth Sciences for Development," "Aerobiology of Diseases, Pests, and Allergens in the Western Hemisphere," "Anthropology Applied to Health Programs"; and 4 May, "Ecology and Deterioration of the Environment."

