

Criton Zoakos; Dr. Clovis Maksoud; and, a late addition, Dr. Rivkin of Hebrew Union College.

Following Morewedge's presentation, in which the noted Islamic scholar presented the thesis that the philosophy of Ibn Sina was based on process- and development-conceptions in contrast to the fixed categories adopted by nominalist thinkers as Aristotle, Locke, and Hume, Zoakos developed the contribution of Medieval Islamic science and philosophy to the European Renaissance and later the American Revolution. It was Islam that first systematically developed the voluntarist principles which are the basis of Western humanism today, Zoakos said, noting that "at a time when no European king or queen and very few monks could read," mass literacy was the basis of the Islamic faith.

Applying that Islamic voluntarist principle to what he termed the "paradoxes" confronting the parties to the Middle East problem, and reflected in a number of the day's presentations, Zoakos pointed out that the framing of such "paradoxes" — presenting a fixed range of solutions, no one of them expressing the actual interests of the parties involved — was the essence of the method used by Britain to manipulate and control the region. The voluntarist solution, he said, is summed up in a maxim of the Talmud, "When presented with two choices, always

take the third." The same problem was addressed by Dr. Maksoud, who declared that Arabs had historically been torn between the two poles of "consistency" — full recovery of Palestinian lands occupied by Israel — and "relevancy" — complete abandonment of any rights of Palestinian sovereignty.

Destroy Britain

Both Zoakos and Rivkin addressed the problem of British presence in the Middle East. Rivkin, citing Manhattan Project as the key breakthrough which demonstrated that the nature of U.S. capitalism was developmental, sharply contrasted this impulse in U.S. capitalism to the capitalism of underdevelopment, centered, he said, primarily in London. It is London's effort to assert hegemony in the Middle East, he asserted, which has been the main obstacle to industrial development in the region.

Zoakos noted that the works of the great Islamic philosophers, Ibn Sina, Averroës, and al-Farrabi, had been in the libraries of every major leader of the American Revolution. No solution to the Middle East can be found without combatting the influence and activities of British intelligence in the region, and the key to that problem, he said, is the solution adopted by the Islam-influenced leaders of the American Revolution: "Destroy Britain!"

— Paul Arnest

Princeton 'Fusion Device' Brings Unlimited Energy Closer

January 25 — Dr. Stephen O. Dean of the U.S. Department of Energy's Magnetic Confinement Division announced yesterday that scientists working with the Princeton University Large Torus (PLT) fusion device have achieved the highest temperature ever to be reached in experimental work with a neutral beam fusion energy reactor prototype. Dean reported that the temperature of the PLT's plasma, the magnetized gas contained in reactor devices that begins an energy-producing fusion reaction if brought to extremely high temperature and pressure, reached slightly higher than 2,000 electron volts (2 keV) in the recent Princeton experiments.

Dr. Dean's announcement came at yesterday's Conference on Middle East Peace and Economic Development, sponsored by the Fusion Energy Foundation as a meeting ground for scientists, government officials, diplomats, and business representatives to discuss the establishment of a lasting Middle East peace via the economic development of the region. (see article this page) The PLT results were of major interest to conference participants because they indicate the rapid achievement of fusion breakeven, that is net-energy producing fusion reactors, and eventually commercial fusion energy production systems.

How It Works

The Princeton researchers set the new temperature record with the help of a neutral beam heating device

designed and built by a team at Tennessee's Oak Ridge National Laboratory. The beam device is used to first accelerate hydrogen isotopes, then to neutralize them (bring the number of electrons and protons in each atom into correspondence), and finally to direct a concentrated beam of neutral atoms into the center of the PLT's plasma, which is confined in a toroidal, or donut-shaped, magnetic field. Collisions with the ions in the plasma cause heating, which radiates from the center of the plasma outward.

Neutral beam heating allows a high temperature to be achieved with a lower magnetic field strength than is used in magnetic heating of magnetically confined plasmas. In fact, a low-density plasma fusion reactor such as the Princeton device will work only with neutral beam heating. Magnetic approaches to heating, which depend on compression and heating of a relatively more dense plasma, are ineffective in the low-density plasma Large Torus.

Prospects for Breakeven

According to Dr. Harold Furth, director of the Princeton neutral beam project, energy breakeven will be relatively easy to achieve using the neutral beam compared to other heating systems. In the small region in the center of the plasma where the neutral beam is injected, about 30 percent of the confined ions are quickly brought to 20 keV; these diffuse to heat through the rest of the plasma. It is now thought that an overall

temperature of between 5 and 6 keV will be sufficient for breakeven.

During the spring, further PLT experiments will include raising the neutral beam energy by approximately a factor of three, which is expected to increase overall plasma temperature to about 3 to 4 keV. These experiments will be carried out on a new plasma heating device, designed to achieve breakeven and now under construction at Princeton. This device, the Tokamak Fusion Test Facility, (TFTF), is expected to use neutral beam heating to the 5 to 10 keV range in order to achieve energy breakeven. The TFTF is expected to be completed by late 1981, if the projected construction schedule can be maintained. However, cutbacks in funding for fusion research announced in the national budget for 1979 may postpone the timetable. Although specific funding

for the project has not yet been revealed, Furth thinks funding is "skimpy but not catastrophic."

In other U.S. experiments, the Doublet III device under construction by General Atomic Company in San Diego is scheduled for operation early this year using neutral beam heating. When brought up to full utilization this is expected to produce energy outputs approaching those required for commercial reactors.

In Dr. Furth's opinion, the Soviets are lagging behind the U.S. in the neutral beam heating approach, having entered the field relatively lately. The French TFR reactor, on the other hand, is very nearly as capable a device as the PLT, achieving plasma temperatures only about 10 to 21 percent lower than those reported from Princeton. The British are entirely out of the running, with no comparable results to report.

— Dr. John Schoonover

FEF Conference Participants

The Honorable Paul Lattimore is in his tenth year as Mayor of Auburn, N.Y., where he is well known for his effectiveness in attracting industry to the central New York State Auburn region. He is presently Chairman of the National Joint Task Force on Energy Strategy of the League of Cities and U.S. Conference of Mayors. Mayor Lattimore was the first recipient of the Citizens Award of the New York State Chapter of Professional Planners.

Uwe Parpart is the Fusion Energy Foundation's Director of Research. Mr. Parpart is a graduate of the West German Naval Academy and has taught and written on basic questions in mathematical physics and strategic planning. He is the author of "The concept of the Transfinite," an important evaluation of the work of Bernhard Riemann and Georg Cantor.

Dr. Morris Levitt is Executive Director of the Fusion Energy Foundation, and also editor of its publications, *Fusion* magazine and the *International Journal of Fusion Energy*. He has testified before numerous congressional committees and state legislatures on energy policy.

His Excellency Iqbal A. Akhund is Ambassador Extraordinary and Plenipotentiary, Permanent Mission of Pakistan to the United Nations.

Eric Lerner is Director of Physics of the Fusion Energy Foundation. He is a graduate of Columbia University and has written extensively on global and regional economic planning and development.

Dr. Mohammed Rabie received his Ph.D. from the University of Houston, and for five years taught economics at Kuwait University. He was also a visiting scholar at Georgetown University's Center for Contemporary Arab Studies, and is the author of a number of books and articles in Arabic. Presently, Dr. Rabie is a private consultant in Houston with Universal Enterprises, Inc., and is a member of the permanent delegation of the Arab League to the Euro-Arab Dialogue with the European Economic Community.

Dr. Richard Dekmijian was born in Syria, and was educated at Boston University and Columbia University, where he received a Ph.D. in political and Middle East studies. He is the author of several books, including *Egypt Under Nasser* (1971) and *Patterns of Political Leadership: Egypt, Israel, Lebanon*, as well as numerous articles including works published in the *Middle East Journal*. He is presently writing a book on President Sadat of Egypt. Dr. Dekmijian is currently a professor at the State University of New York at Binghamton.

Faud Taima has been recently appointed Regional Vice President of the U.S.-Arab Chamber of Commerce for Washington, D.C., after having served as President of the Baltimore-based Mid-Atlantic Arab Chamber of Commerce. Mr. Taima is a prominent figure in commercial, professional and governmental circles both in the U.S. and the Middle East. For the past eight years, Mr. Taima has been President of Averroes, Inc., a McLean, Virginia-based consulting company, and has worked closely with the U.S. business community and the private and public sectors in several of the Arab countries.

Dr. Parviz Morewedge completed his studies in philosophy, mathematics, and Near Eastern studies at the University of California at Los Angeles. He worked as a research mathematician and logician in the computer industry, and has taught at UCLA, the State University of New York at Binghamton, and Columbia University. He is now teaching and lecturing at Fairleigh-Dickinson University, the City University of New York, and the Center for Near Eastern Studies at New York University. Dr. Morewedge is also the Secretary-Treasurer of the Society of Islamic Philosophy and Science, and is the coordinating editor of the series, *Studies in Islamic Philosophy and Science* and translated, with a commentary, the *Metaphysics* of Ibn Sina.

Dr. Clovis Maksoud was born in Lebanon and was trained in law, serving as an attorney in Beirut. From 1961