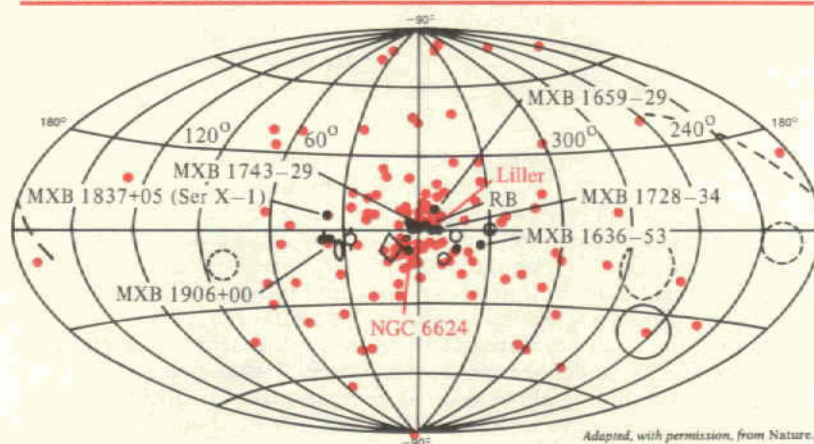


SCIENCE & TECHNOLOGY



Positions of bursters (black) and globular clusters (red). Open areas indicate bursters whose positions are known only approximately.

offered so far has proved entirely adequate, but scientists speculate that the mechanism may be similar to that governing "persistent" x-ray sources—systems in which a small but dense object (as little as 25 kilometers across) and a much larger star rotate around a common center. The small object, perhaps a neutron star or black hole, attracts gas from its larger companion; as the gas "falls," it heats up. When the temperature reaches between 10 and 100 million degrees centigrade, x rays are emitted.

In x-ray bursters, this process may be interrupted by recurrent "chokes" that hold back the fall of gas, then suddenly release it, resulting in a blast of x rays. While the precise nature of the burst continues to elude scientists, 40 observatories in 17 countries joined last summer in a four-week "burst watch" that may yield important new data.

Beggaring Biology

"Biology and the Social Sciences" by Edward O. Wilson, in *Daedalus* (Fall 1977), 165 Allandale St., Jamaica Plain Station, Boston, Mass. 02130.

For every academic discipline (such as molecular biology), there exists an "antidiscipline" (such as chemistry), which helps maintain a healthy tension. Where a discipline is concerned with the discovery and classification of new phenomena, an antidiscipline uses existing theory to search for fundamental laws. It is as an antidiscipline, suggests Harvard biologist Wilson (author of *Sociobiology*), that biology can revolutionize sociology, anthropology, and other social sciences—a proposition troubling to many scholars who feel that human behavior is almost exclusively determined by environment.

In anthropology, for example, the link between cultural and biologi-

SCIENCE & TECHNOLOGY

cal evolution may add to an understanding of kinship, sexual and parental "bonding," xenophobia, and warfare. In psychoanalytic theory, sociobiology can try to reconstruct the evolutionary history of the structure Freud gave to the unconscious. Biology's antidisciplinary influence may even extend to economics, hitherto concerned with only a limited range of biological variables in a single species.

Wilson concedes that there are limits to the kind of "reductionist" model he presents. But if his premise is correct—that *Homo sapiens*, like other animals, can trace some of his behavior to genetics—then "the psychic unity of mankind has been reduced from a dogma to a testable hypothesis." Wilson predicts that once they have absorbed the emerging principles of biology, the social scientists will "go on to beggar them by comparison."

RELIGION & PHILOSOPHY

Pope Paul at 80

"Paul VI at Eighty" by James V. Schall, S.J., in *Worldview* (Oct. 1977), P.O. Box 986, Farmingdale, N.Y. 11735.

Although the papacy has generally enjoyed high prestige in the 20th century, Pope Paul VI (elected in 1963) has received "an unaccountably bad press," especially from Roman Catholics. Critics have found him contradictory, insensitive, and lacking in leadership. His opposition to birth control has sparked controversy and doubt. But Schall, a political scientist at Gregorian University in Rome, believes that Paul, the most traveled Pope in history, has been widely misunderstood.

Paul VI's messages to the modern world, writes Schall, have emphasized the sanctity of the person and the inability of political ideology to provide relief for the human condition. In his *Ostpolitik* contacts with Eastern European Communist nations, he has consistently denied the value of violence and rapid, forced change as "deceitful" and "ineffective." And his most famous social document, *Populorum Progressio*, 1967, which dealt with bringing the poor of the world "into the mainstream of modern life," has come to seem more reasonable with each passing year. (In this context, Schall compares Paul to the late British economist E. F. Schumacher, author of *Small is Beautiful*.)

A just estimate of the Pope, Schall argues, requires scrutiny of the "encyclopedic" range of subjects he has covered in "addressing the problems of the world in a pertinent fashion." Paul's intelligence may be too "French" for the English-speaking world; his approach to Vatican II, abortion, and birth control may have left a legacy of bitterness among some Catholics; but a larger legacy remains intact: concern for the weak, the young, the sick, the isolated, and the deprived, "without letting the metaphysics of group or race or class or nature replace the irreplaceable individual."