SCIENCE & TECHNOLOGY

Quasars' huge red shifts suggest that many are 1 billion light years away. But the notion of objects 1/30,000th the size of Earth's Milky Way Galaxy generating 1,000 times its total energy seemed impossible to many scientists.

Recent findings, however, by a University of Hawaii astronomer confirm the cosmological origin of quasars, reports Maran, a NASA staff scientist.

Astronomers had previously devised a theoretical "proof" of quasars' cosmological origins, pegged to the accepted belief that the red shift of galaxies resulted from the universe's expansion. If it could be determined that quasars characteristically occurred within the remotest, faintly visible groups of galaxies and displayed similar red shifts, then the common origin of these shifts would be undeniable.

Alan Stockton of the University of Hawaii was the first to systematically search the vicinity of large numbers of known quasars for evidence of these galaxy groups. Of the 27 quasars Stockton surveyed in the late 1970s, 17 were located near a total of 29 faint galaxies. When he measured the red shifts of 25 of these galaxies, he found that 13 corresponded to readings from the "nearby" quasars. Stockton calculated the odds against this being coincidence at 1.5 million to 1. In his view, the 12 galaxies that differ in speed from their local quasars are foreground objects much nearer to Earth than their photographs indicate.

Stockton's findings, says Maran, remind scientists how little they know of deep space by showing the universe to be filled with objects defying human comprehension.

RESOURCES & ENVIRONMENT

Get the Lead Out

"Lead in Albacore: Guide to Lead Pollution in Americans" by Dorothy M. Settle and Clair C. Patterson, in *Science* (Mar. 14, 1980), 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

Scientists have seriously misgauged the amount of poisonous industrial lead that has gotten into American and foreign diets, contend Settle and Patterson of the California Institute of Technology's Division of Geological Sciences. Reason: Researchers have consistently overestimated the normal ("naturally occurring") lead levels in the Earth's air and water.

The authors write that world lead production has risen from about 160 tons annually in 3000 B.C. (when smelting was developed) to 3 million tons today. Lead pollution is so pervasive now that even the seemingly low lead concentrations in the cleanest environments are

demographer. The sharpest turnabout has occurred in the Third World, where population growth was considered out of control.

The globe's total population (up from 3.67 billion in 1970 to 4.16 billion in 1977) is still expanding by 70 million people annually. But between 1950 and 1970, the annual increase grew from 43 million to 73 million.

The "fertility transition" underway today in Latin America, Asia, and Africa is much more rapid than that of 18th- and 19th-century Europe. China's birthrate, for example, fell from 40 per thousand persons to 26 in less than 30 years (1950–77). Since 1970, birthrates have fallen even faster in the rest of the Third World.

The new figures show that the population growth-rate declines that demographers expected to occur in the 1980s began to appear as early as the late '60s. From 1960 to 1970, for example, Latin American birthrates fell from 41 to 39 per thousand. Asian birthrates (excluding China's) fell from 48 to 47 per thousand.

These statistics have mystified demographers. Fertility declines have occurred both in small, rapidly developing nations such as South Korea and Taiwan and in economically troubled lands such as India and Turkey. Nations where income distribution is highly unequal (Brazil and the Philippines) have cut birthrates as effectively as China and Sri Lanka, where wealth is rather evenly distributed.

In fact, Eberstadt argues, the main factor behind the transition seems unrelated to government family-planning programs: i.e., the growing tendency of women in poor countries to marry later and work during their peak childbearing years (the late teens and early twenties). What demographers forget, he concludes, "is that, in the final analysis, it is couples, not nations, that have children."

ARTS & LETTERS

Musical 'Martyrs'

"The Myth of the Unappreciated (Musical) Genius" by Hans Lenneberg, in *The Musical Quarterly* (Spring 1980), Circulation Office, 48-02 48th Ave., Woodside, N.Y. 11377.

Many music lovers believe that artistic genius and poverty go hand-in-hand. Yet, most great composers of the past enjoyed critical and economic success throughout their careers—despite the public's frequent lack of enthusiasm for their innovative works, claims Lenneberg, associate professor of music at the University of Chicago.

Major changes in the "sociology of music" denied popular success to Ludwig von Beethoven (1770–1827) and Franz Schubert (1797–1828).