mendations are: That HEW Secretary Joseph A. Califano Jr. move toward boosting manpower at shortstaffed mental hospitals; give priority to training minority and bilingual workers; analyze the impact of privately insured state programs; and assess the current costs of providing specific mental health services, and that an interagency group be established with the federal government to coordinate the administration of community-based programs. □

Energy reorganization is set to begin

Effective Oct. 1, there will no longer be a Federal Energy Administration, Federal Power Commission or Energy Research and Development Administration. Nor will there be energy projects within the Department of the Interior, the Department of the Navy, the Interstate Commerce Commission, the Commerce Department or the Department of Housing and Urban Development. In their place will be a single cabinet-level department, created by President Carter on Sept. 13, to consolidate federal duties, money and manpower relating to energy.

"Simply creating the department will not solve our energy problems," said the President in announcing the Department of Energy. But he added that together with the National Energy Plan, which he introduced to Congress in April (SN: 4/30/77, p. 277), the new agency will provide "the direction and focus of our energy future."

Chief among changes specifically affecting research and development will be a new system of reporting. Energy programs within ERDA, the primary research agency, had been divided by technology—fossil, nuclear, "advanced systems" (including solar, geothermal and wind), environment and safety, weapons and conservation. DOE will instead divide responsibilities by function—that is, as basic research, precommercial-stage technologies, commercial-stage technologies, conservation technologies (including solar heating and cooling) and weapons.

Another change, the effects of which no one is yet ready to comment upon, is that national laboratories such as Argonne, Brookhaven and Oak Ridge will no longer report to regional operations offices but instead will report directly to an assistant secretary of DOE in Washington. Phil Kief of ERDA says the immediate intention behind this change is to streamline reporting; later, however, there will be an attempt to make individual laboratories more "missions-oriented" and programs within a laboratory more "unified." Although changes will occur slowly, he said it was possible that in time one laboratory will, for example, take responsibility for weapons work, another for nuclear research, another for solar. □

Quasar 3C273 ultraviolet spectrum

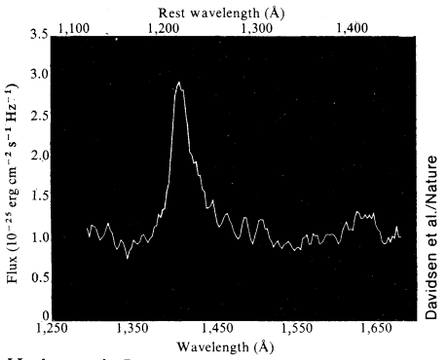
Like Banquo's ghost, quasars will not go away. After a decade and a half of observation the major questions about what sort of astrophysical object they are and what role they have to play in cosmology remain unanswered. It may be some time yet before quasars are put away in a neatly labeled pigeonhole, but a recent significant development, what the observers call the first recording of a quasar's spectrum in the ultraviolet, may put a few constraints on the uncertainties. It even prompts the observers to make a suggestion about that most debated of cosmological questions, the openness or closure of the universe.

The quasar in question is 3C273, one of the oldest beacons, so to speak, of quasar observation. The observers are Arthur F. Davidsen, George F. Hartig and William G. Fastie of The Johns Hopkins University in Baltimore. The observation was made with the Faint Object Telescope, which with a 40-centimeter diameter is the largest optical telescope over flown on a sounding rocket (SN: 7/9/77, p. 24). The total observing time was 235 seconds during which some 13,000 photons from 3C273 were received. The report is in the Sept. 15 NATURE.

The spectrum obtained runs between wavelengths of 1,200 and 1,700 angstroms. In this range the most prominent line, not unexpectedly, is the one called Lyman alpha of hydrogen at wavelength 1,216 angstroms. This line appears with a redshift of 0.16, which is the same as that previously determined from the Balmer series in the visible portion.

If 3C273's redshift is confirmed by comparison of visible and ultraviolet spectral lines—the first time such a comparison has been available for the same quasar—a popular astrophysical model of what a quasar should be is left more than a little shaky. By piecing together partial observations of the strengths of spectral lines in different quasars, a line from here and a line from there, theorists had come up with a model in which a source of ionizing (that is, highly penetrating) radiation is surrounded by filaments or clouds of gas. This model contains the assumption that the ratio of brightness between the Lyman alpha and the H beta line in the visible spectrum should be 40. In 3C273's spectrum it comes out to 4. This discrepancy by a factor of 10 "is likely to have a major impact on [quasar] models," the observers remark.

Cosmologically, 3C273, because of its relatively low redshift, is not very interesting itself. It is the quasars with redshifts above 2 that are mostly concerned in the dispute over the origin of the redshifts: Are they cosmological (due to distance) or gravitational? If one knew the intrinsic luminosities of quasars, one might be able to compare the observed luminosities and have an independent test of the distances and their relation to redshift. The over-all luminosities of quasars vary too much, but there is an hypothesis that comparing ultraviolet luminosities at about 1,450 angstroms might work. The comparison between 3C273 and five high-redshift quasars appears to work if the universe is closed and has about twice the density needed for closure, but these observers caution that it is premature to draw a firm conclusion from that sample. □



Hydrogen's Lyman alpha line is most prominent in 3C273's ultraviolet spectrum.

Pinning down the Viking landers

Locating the Viking landers on Mars with exactitude has been a problem, since they're too small to photograph from orbit. Radio tracking has been the best bet, and it has also been used to refine the "control net," or latitude-longitude grid, by which the positions of the landers and natural surface features are described. Using the newly determined Martian prime meridian on which such a refinement is based, Merton E. Davies of the Rand Corp. reports in the Sept. 23 SCIENCE that the longitudes of landers 1 and 2 are, respectively, 47.82° and 225.59°, each with an uncertainty of ±0.1°.

The best method would have been a photogrammetric one, he says, but the landers have not been locatable on the orbiter photos. "This inability to find the lander locations relative to the local topography is a shortcoming of the Viking mission, and care should be taken in the future to be sure that landers and [proposed surface-roving vehicles] can be located with reference to the local terrain."

In fact, however, it has been done, using the photo that is on the cover of this issue of SCIENCE NEWS. Produced by Ken Jones of JPL (see cover blurb) and applied by Jones and Elliot Morris of the U.S. Geological Survey, it has reduced the longitude uncertainty of lander 1 to ±0.005°. (The technique, says Jones, won't work for lander 2, which has less-conspicuous features on its horizon.) □