legislation amended much more to their liking.

For his part, Representative Seiberling, whose subcommittee will begin marking up the Alaska lands legislation any day now, is not of a mind to offer substantive concessions to those who speak of a resources lock-up. But he would have the legislation prescribe expedited congressional consideration of any future request by a President to open up certain protected areas in Alaska to resource exploration and development or to transportation corridors—provided, however, that the justification for such requests be convincingly documented.

More important in terms of the politics of getting a bill through Congress, Seiberling also now shrewdly proposes that the same legislation which settles the d-2 lands issue also convey to the state and to the natives all land patents to which they are entitled.

But, whatever Congress finally does about the Alaska lands issue, the impending debate over just how far Congress should go in raising barriers to development of pristine natural areas is likely to be audible and intense. From this debate the public may get a sharpened appreciation of the dilemmas that are involved.—LUTHER J. CARTER

RECENT DEATHS

Oscar Bodansky, 76; biochemist and former vice president, Sloan-Kettering Institute for Cancer Research; 21 August.

Albert S. Coolidge, 83; former professor of physics, Harvard University; 31 August.

Clarence M. Ferguson, 78; professor emeritus of agriculture, North Carolina State University; 11 August.

A. H. Gayton, 77; professor emeritus of design and anthropology, University of California, Berkeley; 18 September.

Alphaeus M. Guhl, 79; professor emeritus of biology, Kansas State University; 25 August.

W. H. Horr, 85; professor emeritus of biology, University of Kansas; 12 March.

Aleksandr R. Luria, 75; Soviet neuropsychologist and former head, Moscow Institute of Defectology; 14 August.

John H. Moss, 58; professor of geology, Franklin & Marshall College; 28 July.

John R. Pellam, 62; professor of physics, University of California, Irvine; 23 July.

John T. Maynard, 58; chemist and head, Elastomer Chemicals Department Patent Service, E. I. Du Pont de Nemours & Company; 17 September.

Harold C. Zweng, 54; clinical professor of surgery, Stanford University Medical School; 26 August.

APPOINTMENTS

David B. Ludlum, professor of pharmacology and experimental therapeutics, University of Maryland, to chairman of pharmacology and experimental therapeutics, Albany Medical College. . . . **Ruy V. Lourenco**, professor of medicine, University of Illinois at the Medical Center, to chairman of medicine, Abraham Lincoln School of Medicine at the university. . . . **Charles I. Smith**, chairman of geology-mineralogy, University of Michigan, to chairman of geology, University of Texas, Arlington. . . . **Robert N. Rose**, professor of psychiatry, Boston University, to chairman of psychiatry, University of Texas Medical Branch, Galveston. . . . **James F. Arens**, chairman of anesthesiology, University of Mississippi, to chairman of anesthesiology, University of Texas Medical Branch, Galveston.

RESEARCH NEWS

High Energy Physics: A Proliferation of Quarks and Leptons

Determining the fundamental constituents of matter has been one of the age-old problems of physics. Currently the most popular view—although there are holdouts—is that particles known as quarks and leptons are the most fundamental of all. But, if the interpretations given the most recent experiments at accelerators in the United States and Europe hold up, the number of these basic particles is showing a disturbing tendency to grow—disturbing because, whenever the number of elementary particles begins to increase, it usually means that they are not really elementary after all.

Illustrating this pattern well is the class of protonlike elementary particles called hadrons, which also includes the neutron and the pi meson. Experimentalists have found so many hadrons (literally hundreds) in the last quarter-century that the concept of an elementary particle no longer seemed to fit these entities. Although no quark has ever been unambiguously found, all the properties of hadrons can be elegantly explained under the assumption that quarks exist and are the even more fundamental constituents from which hadrons are formed. For this, as well as certain other reasons, physicists' faith in quarks is very strong right now.

Originally there were three quarks, but the discovery 2 years ago of the J/psi particle, a hadron, and the subsequent particles related to it have been widely accepted as evidence for a fourth quark. What one of the new experiments reveals is the possibility of there being five or even six quarks. Confirming evidence in the coming months could also cement the acceptance of a new meaning for high energy physics. Just as the mantle of high energy physics was once worn by nuclear physics but passed years ago to elementary particle (hadron) physics, so now it may be passing from elementary particle physics to quark physics as more powerful accelerators probe more deeply into the heart of matter.

The discovery of the J/psi particle also capped an emerging realization of a particularly efficient way of searching for elementary particles of a certain type. This method has been used by a collaboration of physicists from Columbia University, the Fermi National Accelerator Laboratory (Fermilab), and the State University of New York at Stony Brook in their discovery of the most massive elementary particle yet found. Dubbed the upsilon, it is this particle that may indicate the existence of a fifth and (possibly) sixth quark. The group did their experiment at the Fermilab's 400 billion electron volt (Gev) proton accelerator.