behavioral sciences

Hyperkinesis and alpha rhythms

Hyperkinesis (hyperactivity) in children is a disorder of inhibitory mechanisms in the central nervous system. Stimuli irrelevant to the activity proper at any moment are not filtered out and the child is at the mercy of all the stimuli in his environment. Central nervous system drugs (amphetamines) seem to be able to activate or strengthen these inhibitory mechanisms. But because these drugs are so often abused, extreme caution has been urged in prescribing them to children (SN: 4/3/71, p. 240).

Taranath Shetty of Boston City Hospital tested hyperkinetic children in an attempt to determine which ones were likely to improve with amphetamine therapy and which ones were not. The alpha rhythms (SN: 11/6/71, p. 314) of these children were measured before and after injections of either dextroamphetamine or methylphenidate. Three weeks later all children were started on oral amphetamine therapy and kept on it for two years. Shetty reports in the Dec. 24 NATURE that those hyperkinetic children whose spontaneous alpha rhythms increased after amphetamine injection responded well to the drugs. On those whose alpha rhythms did not increase the drug caused restlessness, talkativeness and inability to sleep.

The quality of rural living

In the past, political and economic policies in rural areas have concentrated on the needs of the stereotyped rural family: the white farmer family, owning its own productive farm, with children who do well in school. This type of family actually accounts for fewer than half of the farm families and for one-tenth of rural families. Excluded are middle-class rural non-farmers, Mexican migrant workers, rural Mexican-Americans in the West, rural blacks in the South and rural Indians and Puerto Ricans.

The Agricultural Board of the National Research Council has published a new report. It notes that although 30 percent of the United States population live in rural areas, 40 percent of the poor live there. Only 12 percent of the nation's nurses, 14 percent of pharmacists and 8 percent of the pediatricians service these people. Because of lack of adequate services, the incidence of heart disease, hypertension and uncontrolled arthritis is much higher in rural areas than in urban communities.

The NRC report hopes to disprove the stereotype and identify rural groups and their special problems of economics, medicine, welfare, education, housing and other aspects of living.

A male chauvinist computer

The talking computer has long been a favorite of science fiction writers. Scientists at the Stanford Research Institute in Menlo Park, Calif. have finally started to build one. Bertram Raphael, manager of the Artificial Intelligence Program at SRI, says the computer will be able to converse with its programmers—answering questions verbally. There will be no problem as long as the questioners limit themselves to a 1,000-word vocabulary programmed into the device and as long as they speak clearly in pure American male English. Raphael says women talk differently and the computer might have trouble understanding them.

space sciences

More on a layered moon

After Apollo 15, Gary Latham of the Lamont-Doherty Geological Observatory said that the moon had a mantle and a crust (SN: 9/11/71, p. 167). Now interpretations of seismic data by his colleagues seem to concur. At the American Geophysical Union meeting in December, Nafi Toksoz of the Massachusetts Institute of Technology reported that the moon's crust consists of two distinct layers of igneous rock. The upper layer is of fine-grained basaltic rock and extends to about 25 kilometers. The lower layer (from 25 to 65 kilometers) is of a coarse-grained material. It appears, says Toksoz, to be seismically similar to gabbro—a granular igneous rock. Below the lunar crust is a mantle of unknown depth, although it extends at least to 100 kilometers—the depth to which the man-made seismic signals have probed. The velocities in the mantle are higher than those for most earth rocks, but are close to those seen in magnesium-rich olivine.

"The evolution of such a lunar crust," says Toksoz, "requires extensive differentiation of the lunar mantle and implies that melting or partial melting of the lunar interior had been extensive in its early history." This interpretation is not consistent with interpretations of magnetic and electrical field measurements taken at the lunar surface so far that indicate a rather cool (900-degree C.) present interior.

Amino acid precursors in moon material

Sidney W. Fox of the University of Miami found almost the same amino acid precursors in the Apollos 11 and 12 samples as did Cyril Ponnamperuma in the Murchison meteorite (SN: 12/5/70, p. 429). Scientists at NASA's Ames Research Center used another method to search for the precursors and did not find them.

Now both teams are using the same method—extraction of lunar compounds by hot water, then acid breakdown in water and analysis of the extract—to find amino acids. They recently met to compare the results of their studies of the Apollo 14 lunar samples and emerged with "remarkably good agreement," says Fox, that precursors of amino acids do indeed exist on the moon, in very small amounts.

According to Fox, evolution to and beyond amino acids was stopped on the moon probably because the water necessary for further changes to life was not there.

His research group in Coral Gables was due to receive in late December lunar samples from the Apollo 15 mission.

A new airborne snoop camera

RCA has developed a new series of cameras that are 10 times more sensitive to light than existing systems. The cameras—called Airborne 3100 through 3400—are automatic, remote-viewing television systems that can secure pictures in conditions from a very dark day down to an overcast night sky. The cameras have silicon intensifier target tubes (like those used on the moon during Apollo 15) that can perform in bright sunlight, as well, and are relatively immune to damage when pointed directly into the sun.

They will be used for airborne reconnaissance and weapon delivery applications or in remotely piloted vehicles and drones.