

physical sciences

Germanium 64 and heavy elements

Among the explanations of how heavy elements could have been synthesized in stellar processes out of the abundant hydrogen and helium is one that depends on a series of nuclei with equal numbers of neutrons and protons (helium 4, nickel 56, zinc 60 and germanium 64). Synthesis proceeds up the chain by successive capture of alpha particles (helium 4 nuclei).

Because germanium 64 had never been seen in nature, calculated values for its binding energy were used. As a result the theory predicted an abundance of isotopes of mass 64 (which would have been produced by subsequent changes in germanium 64) much less than actually found. In the July 10 *PHYSICAL REVIEW LETTERS* R. G. H. Robertson and Sam M. Austin of Michigan State University report that they have made germanium 64 in the laboratory and that its actual properties will not resolve the discrepancy. They suggest that the elements of weight 64 cannot be derived through germanium 64 by this kind of chain process.

Water, hydroxyl and protostars

Theorists believe that the clouds of water (H₂O) and hydroxyl (OH) molecules that radio astronomers have found in interstellar space represent protostars, the early stages of condensation in star formation. High-resolution observations of the regions from which the water and hydroxyl radiations come have shown that the emission comes from high-intensity spots.

The question remained whether the water and hydroxyl were in the same spots. Some theorists have suggested there may be chemical connections in the formation of the two molecules. Others suppose they may be different stages in the condensation of a protostar.

In the July 15 *ASTROPHYSICAL JOURNAL* a group from the University of California at Berkeley (Richard Hills, Michael A. Janssen, Douglas D. Thornton and William J. Welch) report that measurement of the positions of the water sources shows that they do not generally coincide with the hydroxyl. This could imply that different conditions are necessary for the production or excitation of the two molecules.

Self-trapping gravity waves

Physicists continue to fascinate themselves with the Weber problem, the dilemma that the gravitational waves recorded by Joseph Weber of the University of Maryland seem to require a source that would have converted the center of our galaxy to gravitational radiation by now if it radiates isotropically (SN: 7/8/72, p. 30).

In the July 3 *NATURE PHYSICAL SCIENCES* Svein O. Olsen of Tromsdalen, Norway, suggests a kind of beaming called self-trapping. Self-trapping happens to light when it enters substances in which the dielectric constant varies with the intensity of the light. The light rays tend to concentrate or focus themselves into narrower and narrower filament-like regions of the substance. Olsen points out a similarity between the mathematics that governs the propagation of light waves in such substances and those that govern propagation of gravitational waves in the space-time continuum. He suggests that space-time itself may be a self-trapping medium for gravity waves and that they concentrate themselves in filamentary regions of it.

behavioral sciences

Shocking political behavior

In an attempt to study the effect of political beliefs on interpersonal behavior, researchers at the University of Connecticut at Storrs monitored the interactions of 30 extreme liberals and 30 extreme conservatives. The subjects were male college students, selected by their responses to a political issues questionnaire. Each was put into a nonverbal teaching situation where he had to communicate a series of numbers to a person he knew to be of the same or opposite political persuasion. They were told wrong answers could be signaled by an electric shock of controllable intensity and duration.

Amerigo Farina, Barry Chapnick, Jason Chapnick and Raffaello Misiti report in the June *JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY* that radicals tended to give intense shocks of short duration, especially to the conservatives. Conservatives gave less intense but longer shocks, especially to the radicals. The researchers feel the radicals acted intentionally but felt immediate guilt. Thus the short shock. The conservatives, they say, were less aware of attempts to punish the other person. They did it subconsciously with the low intensity shock. Even so, say the researchers, the conservatives could have inflicted great pain had the long shock been real.

Prisoners of war

The surviving members of the USS *Pueblo* crew were returned to the United States in December 1967 after 11 months of imprisonment in a hostile country. Upon arrival each man was given a complete medical and psychiatric examination. Raymond C. Spaulding and Charles V. Ford of the Naval Hospital in San Diego, Calif., report in the July *AMERICAN JOURNAL OF PSYCHIATRY* on how different personality types reacted.

The men who stood up best they characterize as bright and schizoid. These men had the ability to isolate their affect and entertain themselves with fantasy. The factors associated with poorer adjustment were youth, immaturity and personality characteristics of obsessive-compulsiveness, passive-dependency or instability.

A psychiatric reevaluation, three months later, revealed a repatriation syndrome similar to reactions noted in prisoners returning after World War II and Korea. After several days many men began to show hostility toward fellow prisoners and superiors. A readjustment period is necessary, the researchers say, and suggest that prisoners from Southeast Asia be returned, not by jet, but on a slow sea voyage.

Female homosexuality

Studies of homosexual men have found some evidence linking homosexuality with hormone levels (SN: 12/4/71, p. 376). A similar study with 42 volunteers who were members of a lesbian organization failed to find similar links. Physical and psychological investigations were carried out by A. J. Eisinger, R. G. Huntsman and Jenny Lord of St. Thomas' and Lambeth Hospitals in London; J. Merry and P. Polani of Guy's Hospital in London; J. M. Tanner and R. H. Whitehouse of the University of London, and P. D. Griffiths of Dundee University. The researchers report in the July 14 *NATURE* that, apart from their sexual orientation, lesbians are more neurotic and less extrovert, but are apparently normal in all other respects.