

More SIDS clues: Vitamins and heat

Although some scientists believe they are zeroing in on possible causes of sudden infant death syndrome (SIDS), there remain more than 100 theories on the origins of the mysterious, lethal disorder (SN: 4/15/78, p. 234). And for all the theoretical progress, the exact mechanisms that cause apparently healthy infants to die in their sleep—most commonly between 2 and 4 months of age—are still unknown in most cases. But the possibility that environmental and emotional, as well as biological, components may contribute to SIDS has been strongly suggested in a number of studies.

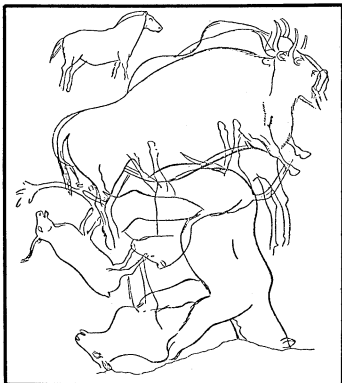
Among the latest bits of evidence in this direction is a report in the May 15 *NATURE* by A.R. Johnson and R.L. Hood of CSIRO Division of Food Research in Sydney, Australia, and J.L. Emery of Children's Hospital in Sheffield, England. The researchers found first that young chickens suddenly and unexpectedly died after being partially deprived of the vitamin biotin and then exposed to "mild" stress—"... disturbance and removal of their food at 2:30 a.m. resulted in the chickens being dead, or almost dead by 8 a.m.," report the scientists.

This prompted the researchers to examine the bodies of 35 human SIDS victims and compare the results with those found with infants who had died of known causes. Using a radiochemical technique to measure biotin content in the deceased infants' livers, Johnson, Hood and Emery found that "the levels of biotin in the livers of infants who had died of sudden infant death syndrome were significantly lower than those in livers of infants of similar age, who had died of explicable causes. . . . The findings do not suggest that SIDS results from biotin deficiency alone," they say, "but . . . we postulate that biotin insufficiency may leave the infant in a condition in which SIDS can be triggered by mild stress, for example, a missed meal, excessive heat or cold or a changed environment."

The postulation involving excessive heat received support from an unrelated study in the May 17 *LANCET*. British researchers report that eight of 33 SIDS cases they studied bore striking similarities to symptoms seen in heat stroke death. The symptoms—involving changes in the small intestine—were not seen in any of 12 infants who died of known causes, report A.N. Stanton of Northampton General Hospital and D.J. Scott and M.A.P.S. Downham of the Royal Victoria Infirmary in Newcastle upon Tyne. They say the possibility of overheating may be further supported by the finding that 13 of the SIDS babies "were judged to have been excessively clothed or covered at the time of death."

Is there an artist in the cave?

The seemingly advanced cave paintings of Cro-Magnon man are not, as some suggest, the products of an enhanced artistic sense. Rather, they resulted from eidetic imagery—or photographic memory—which was common to primitive adults of the Paleolithic period. So says Princeton University's Julian Jaynes, who suggests that engravings such as these—reproduced from the cave of La Mairie at Teyjat—were "projected" from vivid memory: their superimposition, he says, indicates they were projected regardless of what was on the wall in the first place.



Julian Jaynes

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Propelled by the heat of the earth

Photovoltaic solar cells don't work in the dark. But Leo Lemley's earth-albedo sensors do, which is why the navy is developing them to power platforms in space.

Essentially, Lemley's albedo arrays are solar cells. The long-wave infrared (LWIR) thermal energy they collect is really a reflection or reradiation of energy that originated from the sun. But because LWIR is emitted from any spot on the earth's surface continuously, day and night, Lemley's power converter can also run day or night.

Lemley described the array he is developing at the Naval Research Laboratory in Washington as a bismuth-telluride thermoelectric element—which converts heat to electricity—sandwiched between one-mil thick copper conductors. Exposed surfaces on either side of the sandwich are blackened to maximize their efficiency at absorbing thermal energy emitted by the earth and radiating waste heat into space. Even absorbing 95 percent of the incident 8- to 14-micron LWIR radiation—which at best is expected to be 140 watts per square meter of collector—the system's energy-conversion efficiency is only three percent. However, that is still better than anything available, the NRL research physicist told *SCIENCE NEWS*.

The navy wants to propel and power military platforms—such as balloons or low-orbiting satellites—above the weather (perhaps 40,000 feet up). But the arrays could be used commercially for relaying telecommunications or television signals. And at about five dollars per square meter, they are probably well within the budget of a municipality or developing nation.

Lemley hopes to increase slightly the array's efficiency and decrease its weight before space trials begin in a year or so.

The engineer's racquet

Princeton University's Enoch Durbin retools automotive systems (SN: 11/10/79, p. 328), and tennis racquets. Durbin found that the node, or sweet spot—the point at which a ball must be hit to keep it from deflecting off at an angle—was not in the center of the strings (where most aim to hit the ball) but nearer the handle. Redistributing and reducing a racquet's weight, he enlarged the node and moved it to the center. In so doing, he softened the angular deflection of balls hit other than on the node. Durbin claims his racquet—marketed in limited numbers—improves serves and net games.

Watery bites

A new wave of high-powered cutters is hitting the streets and they're made of water. One tested in Cicero, Ill., last year proved that it could cut not only through concrete, but also through the cost, noise, dust and machinery normally associated with road repairs. And the National Science Foundation, which funds water-jet research, says in one rock-quarry test water jets halved the time needed to slice through granite.

The Cicero test directed 45,000 pounds-per-square-inch pressure from a 110-horsepower jet to slice a three-inch cut of concrete for \$1.31 per square foot. Doubling horsepower would cut the cost to \$0.71/ft², less than half the average. Jets, which must be within inches of the cutting surface, deliver their bite via a rotating nozzle.

But the Swedes offer a real blast. Stockholm-based Atlas Copco splits rocks—causing them to implode, not explode—with a water cannon. It fires a half gallon of water at nearly 1,000 feet per second into a 2.5-foot-deep hole (that has been drilled conventionally). Resulting shockwaves create radial and axial cracks that migrate to a rock's surface. Able to blast clay and dirt, the cannon can also "shoot" fence- and light-post holes.

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