

Magnetic termites: 360° in the shade

Magnetic or "compass" termites in northern Australia have fascinated entomologists for many years. With little deviation, the termites (*Amitermes laurensis*) always build their long, narrow, wedge-shaped mounds aligned along a north-south axis.

Gordon C. Griggs of the University of Sydney has suggested that the north-south orientation may be used for thermal considerations. In the cooler mornings and evenings, the broad flanks of the termitarium would present maximum exposure to sunlight, while at noon, the narrowest edge would be faced to the sun. Thus, temperatures in the mound would stay relatively stable throughout the day.

Griggs postulated that if the thermal hypothesis were correct, the north-south orientation of nests in the shade would not be so crucial. He predicted that the amount of variation from the north-south axis would be greater in the shade than in open areas.

Unfortunately, the hypothesis could not be proven. Writing in the *AUSTRALIAN JOURNAL OF ZOOLOGY* (25:87), Griggs and A. J. Underwood found the variation in shaded and open areas was not statistically different. They measured 248 mounds in four separate fields and found some variation in all the fields (from 349° to 30°). The authors speculate that because all the workers in one nest come from one mated pair, genetic factors may be responsible for the north-south orientation.

Can sea urchins survive biology?

Sea urchins provide such interesting experimental and demonstration subjects for biologists that some species have been overharvested by researchers. One such case occurred in the 1950s when avid experimenters at Woods Hole discovered they had collected all the purple sea urchins in the area.

The same concern has now been extended to two Pacific coast sea urchins, *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus*. Biologists have been fishing both species, principally the former, but *S. franciscanus* is also fished commercially for its gonads, considered a delicacy.

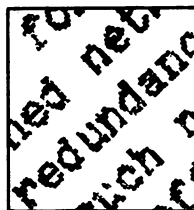
Mia Tegner and Paul Dayton of the Scripps Institution of Oceanography conducted experimental harvests to discover how the sea urchins' populations were affected. They report in the April 15 *SCIENCE* that the adult urchin provides important shelter for the juvenile *S. franciscanus*. Tegner and Dayton found nearly all the young *S. franciscanus* hid under the long spines of the adults. The spines also protect abalone, shrimp, crabs and other bottom dwellers. When the researchers removed all the adults from a reef, they found the number of juveniles left was significantly lower than on an unharvested reef. Their findings suggest that some adults must be left on the bottom in order to provide for the safety and upbringing of future sea urchin populations.

Avoiding irritable sea slugs

Navanax inermis is a myopic, carnivorous sea slug that relies on chemoreception to find mates and potential prey. Thriving in the mud flats off the California coast, this creature picks up the scent of slime trails left by others of its kind.

Another important pheromone of *Navanax* has now been isolated by Howard Sleeper and William Fenical of the Scripps Institution of Oceanography. Writing in the March 30 *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*, they report that irritated *Navanax* secrete three bright yellow methyl ketones. When another slug senses the pheromone, it takes a sharp turn away, thereby avoiding the other's bad temper.

High-speed facsimile transmission



What appears to be the first of a new generation of high-speed facsimile transceivers is now heading to market. The 3M Company has announced it will soon start shipping the first units of its Express 9600 transceiver, which will cut the time required to transmit a standard 300-word typewritten page from 6 minutes down to 30 seconds.

The company calls it "the world's fastest viable system for high-priority mail."

The device scans a page with 123 lines per inch and each line converted into 1024 digital "bits." This digital information is then "compressed"; that is, only the minimum necessary "run-length" of scan is actually retained. The compressed digital information is then converted to a sound signal.

Recently, the international committee that agrees on specifications for telecommunications equipment (acronym CCITT) proposed standards for such digital transceivers. A company official told *SCIENCE NEWS* that the Express 9600 is the "first announced U.S. high-speed facsimile machine intended to meet the proposed CCITT standards."

Competing models should follow quickly, particularly as the push for "electronic mail" gains momentum (*SN*: 2/12/77, p. 106). The 3M device costs \$14,500 to purchase or \$295 per month (plus 3¢ a minute transmission time) to lease.

Coal gasification pilot plant



The first U.S. industrial facility designed to gasify all types and grades of coal without pretreatment has been put into operation by the General Electric Co. The plant can use inexpensive grades of coal, which normally tend to cake and clog gasification equipment, and convert more than three-quarters of a ton per hour into 100,000 cubic feet of synthetic fuel gas. The plant is located at the GE Research and Development Center, Schenectady, N.Y.

The gas produced contains only 160 BTUs of heat energy per cubic foot—about one-sixth that of natural gas. But since such low-BTU gas is relatively inexpensive to produce, GE says that it "promises to be economically attractive for electric power production."

One innovation that should make the plant more efficient than previous designs is an extruder to feed coal into the gasifier, like toothpaste squeezed from a tube. A 6-inch-thick rod is formed of fine coal particles and tar (see photo), much of which is wasted in other gasifiers.

Designing by computer



The Control Data Corp. has marketed what one company official calls the "first universal computerized structural analysis system" in the industry. Called UNISTRUC, the system allows an engineer to create a computerized, 3-dimensional model of a structure in as little as one-quarter the time required by previous methods.

The new system is available on CDC's time-sharing CYBERNET Service network and is already used in reactor design.