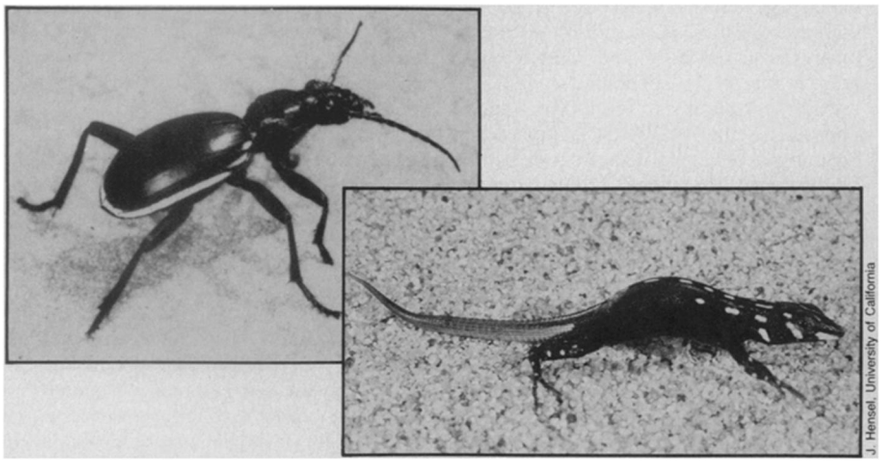
will be to "spend the money and do it right" with two new spacecraft. From a scientific standpoint, an informal polling of researchers reveals differing viewpoints about whether it is better to take advantage of Viking's momentum by shooting for the earlier date, or to wait and take advantage of Viking's data-packed return.

Being considered for future space missions are a pair of low-thrust, long-term propulsion systems—solar electric propulsion and solar sails—envisioned for such goals as a long, velocity-matched flyby of Halley's comet. Neither is included in the fiscal 1978 budget request, but both are being studied at Jet Propulsion Laboratory under recently reprogrammed fiscal 1977 funds for a possible decision in August. The request does, however, include funds to begin production of the third, fourth and fifth space shuttle orbiter stages. □

A lizard in beetle's clothing



Survival of the mimic: Juvenile lizard imitates Anthia bettle in color and gait.

Volkswagen isn't the only imitator of the lowly beetle. Juvenile lizards of the species *Eremias lugubris* in southern Africa walk stiffly and jerkily with arched backs in an apparent attempt to imitate a neighboring insect. And researchers now have evidence that the lizards' mimicry is successful.

According to an important hypothesis of evolutionary theory, palatable and unprotected individuals can gain protection from predators by imitating an unpalatable or well-armed species. "The resemblance of juvenile *E. lugubris* to oogpister beetles represents not only the first substantive case of mimicry involving a quadrupedal lizard, but also, to the best of our knowledge, the first case of a terrestrial vertebrate mimicking an invertebrate," say zoologists Raymond B. Huey of the University of California at Berkeley and Eric R. Pianka of the University of Texas.

The oogpister beetle is well equipped to discourage attackers. The beetle can eject a pungent fluid of formic acid and assorted other acids and aldehydes.

The juvenile lizards are certainly in need of protection, being palatable and relatively defenseless. Against the pale sand, a lizard's jet-black skin with white broken stripes makes it an obvious target for birds, snakes, foxes and jackals. Paradoxically, because it is conspicuous and looks like a noxious beetle, predators avoid the lizard.

In their field study, funded in part by the National Geographic Society, Huey and Pianka observed that the lizards changed to adult coloration, pale red-tan, when they reached body lengths of 40 to 50 millimeters. That length is about the maximum size of an oogpister beetle. At the same time, the lizards' foraging movements also changed. Adults move with lateral undulations, typical of most lizards, instead of the stiff juvenile gait.

The lizards and beetles meet various criteria for successful mimicry. The lizards are fewer in number than the beetles, are active only during times of day and year when the beetles are active and live only in areas also populated by the beetles.

"These noxious beetles are thus ideal models; juvenile lizards have apparently converged on them both in behavior and morphology," the researchers write in the Jan. 14 SCIENCE. "Indeed, on occasion we have initially mistaken juvenile lizards for oogpisters."

But does the disguise work against the lizards' natural enemies? "We cannot measure predation rates directly, but the frequency of broken tails can be used to index relative intensity of predation," say Huey and Pianka. They found that of all the related lizard species in the southern Kalahari, *E. lugubris* has the lowest frequency of broken tails.

This indirect evidence, they explain, is one of the few nonmanipulative examples supporting the hypothesis that natural selection promotes mimicry of species with stronger actual defenses. □

Female hormones and birth defects

In 1971, there was a disturbing scientific discovery—that the synthetic estrogen DES (diethylstilbestrol), a medication used for threatened miscarriage, could cause vaginal cancer in female offspring many years later. Then from 1973 to last year, other equally unsettling reports started to surface—that use of not only DES but also other estrogens and progesterones during pregnancy could lead to cardiovascular defects in offspring.

Now those initial reports, based on small numbers of subjects, have been confirmed in a much larger study. It is reported in the Jan. 13 NEW ENGLAND JOURNAL OF MEDICINE by Olli P. Heinonen, Dennis Slone, Richard R. Monson, Ernest B. Hook and Samuel Shapiro of Boston University Medical Center, Harvard School of Public Health and Albany Medical College.

The group conducted a study of 50,282 pregnant women at 12 American hospitals between 1958 and 1965. They obtained extensive information about which estrogens and progesterones the women were exposed to during early pregnancy, either through prescriptions for threatened miscarriage or other pregnancy problems or through inadvertent use of oral contraceptives after they were pregnant. The investigators found that these agents were used by 1,042 of their subjects. Of them, 438 (42 percent) used both estrogens and progesterones (278 from oral contraceptives), 176 (17 percent) used estrogens exclusively, and 428 (41 percent) used progesterones exclusively. All the subjects' offspring were examined for congenital heart disease without prior knowledge of which ones' mothers had been exposed to hormones during pregnancy. This way observer bias was unlikely.

Out of 50,282 total pregnancies, 19 children with heart defects were born to 1,042 women who received female hormones during early pregnancy (18.2 per 1,000). Among 49,240 children not exposed to these agents, there were 385 with cardiovascular malformations (7.8 per 1,000). In other words, women who took the hormones were twice as likely as other women to have babies with heart defects.

When the researchers separated out prenatal exposure to specific hormones, they found that the risk was 2.1 times as great as normally expected for combined estrogen and progesterone use, 1.4 times for estrogen only and 1.5 times for progesterone only. For oral contraceptives, which was a subgroup of combined exposure, the risk was highest of all—2.4 times as great. However, the data on the separate effects of estrogen and progesterone were inadequate to be statistically significant. "The separate and combined roles of estrogenic and progestational