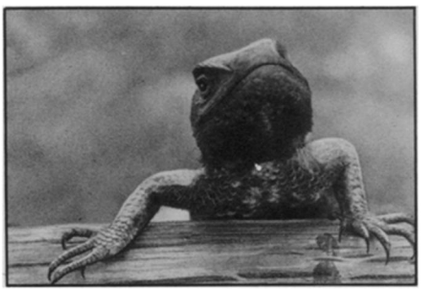
Reptilian fever: Burn, baby, burn



Fever—at least for lizards—is a defense mechanism that allows greater survival during infection. When lizards such as the desert iguana *(Dipsosaurus dorsalis)* catch certain bacterial infections, they crawl out into the sun, heat up to 41 or 42°C., and wait for the infection to subside. Only a few—0 to 33 percent—die. But a Michigan team found last year, that when the iguanas are infected and kept artificially at normal body temperature, 75 percent die. That same team now reports a new test in which sodium salicylate is used to artificially lower fever, and the results of this interference are even more deadly.

Physiologists Harry A. Bernheim and Matthew J. Kluger of the University of Michigan Medical Center at Ann Arbor present their new study in the July 16 SCIENCE. They determined last year that the desert iguana is more likely to die from infection by *Aeromonas hydrophila* if prevented from reaching medium or high grade fever, and concluded that fever is an evolved survival mechanism in those animals (SN: 4/12/75, p. 237). This time, they performed four experiments to test antipyretic drug effects.

Four groups of iguanas were injected: one group with saline; one with live bacteria alone; one with sodium salicylate alone, and one with both live bacteria and sodium salicylate. Results from the first three groups showed that the injections themselves were not deadly, that the drug itself was not toxic and that most infected lizards with fevers do survive. In the fourth test group, 100 percent of those that responded to the drug (and thus did not develop fever) died from the bacterial infection, while 100 percent that did not respond (thus had fevers), survived.

Whether these findings can be extrapolated to higher vertebrates is unknown, the researchers state, but the characteristics of fever are similar in reptiles, birds and mammals and so are the responses to bacterial injections and to sodium salicylate. "It is tempting," they say, to suggest a common defense mechanism with a common evolutionary origin. □

Measuring ocean bumps and hollows

Tides and waves aside, the ocean's surface turns out to be rather lumpy, according to the latest satellite information. The GEOS-3 satellite, launched last year, can measure the distance down to the ocean's surface to an accuracy of 50 centimeters and has begun measuring its rather complex topography.

One major result of this discovery, says Ron Mather, associate professor in the Department of Geodesy at the University of New South Wales, Australia, may be a better understanding of ocean currents. Along the 2,000-mile eastern coast of Australia, for example, the "sea level" at the north end is fully two meters higher than at the south end—and the prevailing offshore current is strongly southerly.

In mid-1978, a new satellite called Seasat, may help clarify the picture even more, by providing topographical data accurate to within 10 centimeters. Mather believes Seasat may be able to provide clues to the cause of the irregularities. □

New therapy for penicillin allergy

Three years ago a team of Harvard researchers had preliminary evidence that a new approach to treating allergies might work—namely the switching off of those antibodies that trigger an allergic response. They now have much stronger indications that the approach is feasible, and it looks as if the first patients to benefit may be those allergic to penicillin.

The only treatment now available for allergies is time-consuming, costly and too often ineffective. It consists of weekly shots of the allergen (chemical) to which a person is allergic. Clearly a more effective and economical treatment is needed, so David H. Katz and his colleagues at Harvard Medical School decided to look for one.

First they found that if a synthetic chemical called D-GL is linked with a chemical called Dnp and then this chemical packet is injected into animals, the packet blocks the production of those classes of antibodies involved in allergic responses, namely the IgM, IgG and IgE antibodies (SN: 11/10/73, p. 294). Next they discovered that if D-GL is coupled with a nucleoside, and this chemical packet is injected into animals, it too snuffs the production of these classes of antibodies. And now they have found that if the penicillin allergen is coupled with D-GL and injected into animals, the packet turns off antibodies in those classes. Even more significantly, it switches off only those antibodies that react specifically with the penicillin allergen, not those antibodies needed to fight infections. The allergy-triggering antibodies were also switched off for a long period—six months.

These results, Katz and his colleagues conclude in the June PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, provide a direct demonstration of the potential application of the D-GL immunotherapeutic approach to penicillin allergy in people. They foresee that the treatment can be used on penicillin-allergic patients so that they can receive penicillin when they need it, and so that they can also be protected against inadvertent, life-threatening exposure to penicillin. The treatment, they believe, may also help victims of penicillin-induced, antibody-related hemolytic anemia which leads to the excessive destruction of blood cells.

How does D-GL combined with penicillin allergen or another molecule switch off antibodies to the allergen or molecule? Katz and his co-workers aren't sure. D-GL may hook up with those lymphocytes (B cells) that make the offending antibodies and thereby prevent the B cells from making them. Or possibly D-GL interferes with some enzymatic step involved in the production of antibodies by the B cells. □

Marijuana for better breathing

Marijuana does have some positive medical effects, and now that the debate over the uses and abuses of the drug has cooled, researchers are beginning to examine more closely the implications of using marijuana as medicine. The most recent reports concern marijuana's effects on the bronchial passages. According to two research teams, marijuana may prove effective in the treatment of asthma and other respiratory ailments. The reports are in the July/August RESPIRATORY THERAPY.

Working with male volunteers, Louis Vachon of Boston University School of Medicine found that THC (one of marijuana's active ingredients) opened the bronchial tubes and increased air flow by 44 percent. Similar findings come from Donald Tashkin of the University of California. Work done with 32 healthy, experienced marijuana smokers showed that bronchial passages opened significantly after smoking marijuana, reached a peak in 15 minutes and still showed marked improvement one hour later. Tashkin warns, however, that continued heavy marijuana smoking might lead to respiratory complications. Steven Szara of the National Institute of Drug Abuse says, "We are just now beginning to do research that may eventually reveal some therapeutic applications of marijuana." But he too has reservations. In addition to possible respiratory complications from heavy smoking, he warns that marijuana

Continued on page 58