

Soviets visit Nevada nuclear-test site

A delegation of 20 Soviet nuclear testing experts spent this week at the Nevada facility where the United States tests its nuclear weapons. The visit was part of a bilateral effort to develop on-site systems that monitor compliance with limits on testing. This event follows a similar visit earlier this month to the Soviet testing site in Kazakhstan by a group of experts from the U.S. government.

The Soviet team is touring the facility and learning the testing procedures at the site, according to the U.S. Arms Control and Disarmament Agency in Washington, D.C. Accompanying the Soviets are many of the U.S. officials who visited the Soviet testing site.

The exchanges are aimed at removing obstacles to the ratification of the Threshold Test Ban Treaty and the Peaceful Nuclear Explosions Treaty. The treaties, which limit nuclear test yields to 150 kilotons of TNT, were signed by the Soviet Union and the United States in the mid-1970s. Although both sides have pledged to honor the agreements, neither has ratified them. In the United States, ratification requires the consent of two-thirds of the Senate.

Standing in the way of ratification has been the issue of verification: The two parties have yet to agree on a system that will ensure compliance with the testing limits. The United States has traditionally preferred a hydrodynamic system called CORRTEX for measuring the yield of an explosion, while the Soviets have favored seismic monitoring (SN: 10/26/85, p.268).

CORRTEX, which stands for Continuous Reflectometry for Radius versus Time Experiment, relies on a cable that can be placed in the same hole that contains the explosives or in a nearby hole. As shock waves from the explosion pass through the cable, they affect an electrical pulse that travels along the cable. The changes in this pulse enable scientists to estimate the yield of the explosion. Alternatively, seismic techniques use meters that measure the ground-shaking caused by the explosion. These meters can be placed up to thousands of kilometers away from the blast.

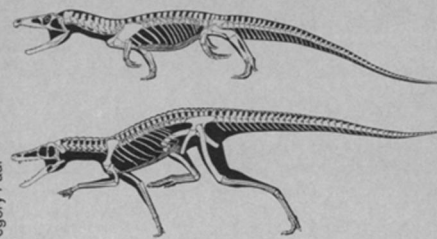
There is debate over which system gives a more accurate estimate of the yield of nuclear explosions.

During the visits this month, the delegations are preparing for future joint verification experiments to be held at the testing sites in Nevada and Kazakhstan. The experiments will allow each side to demonstrate its preferred technique to measure nuclear explosions of yields near 150 kilotons. The schedule for these experiments will be discussed at the second round of nuclear testing talks that begins in Geneva Feb.15. — R. Monastersky

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New look at the sprawl in gator's gait

With their sprawling belly-walk and other primitive features, today's crocodiles, alligators and other crocodylians look as if they've crawled directly out of the most ancient reptilian past. But living crocodylians are also known to walk, and at times even gallop, in an erect posture, with legs held close to their bodies in a manner characteristic of the more advanced dinosaurs and mammals.



Reptilian walks of life: sprawling (top) and erect (bottom).

Because today's crocodylians are thought in some ways to be living relics of prehistoric times, and because they display both kinds of walking postures, paleontologists have long believed that the earliest crocodylians represented a link between primitive, lizard-like reptiles that sprawled and the more erect reptiles that evolved later.

But according to the most recent issue of PALEO BIOLOGY (Vol.13, No.4), this theory is out of step with the fossil evidence. Paleontologist J. Michael Parrish, at the University of Colorado Museum in Boulder, concludes that the earliest crocodylians and their nearest relatives (collectively known as crocodylomorphs) stood and walked erect. The sprawling stance and gait that living crocodylians use while sliding into water, he says, are more recent adaptations, made when the animals moved from a primarily terrestrial home to an aquatic one.

Parrish's conclusion is "quite reasonable," comments paleontologist Kevin Padian at the University of California at Berkeley. "He's straightened out a little

bit about the sequence of evolution of these gaits, how they have changed and even reversed themselves in the history of a group."

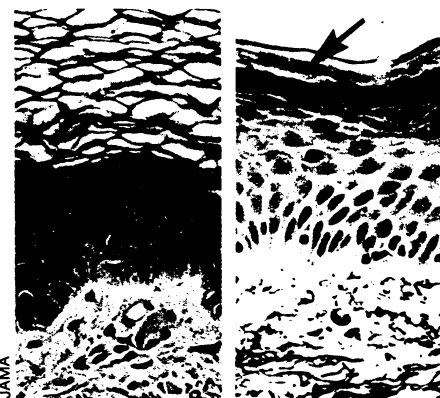
In the past, says Parrish, most studies have concentrated on systematics, or the evolutionary relationships among animals. "I've been trying to integrate systematics with other approaches," he says. In particular, he has focused on limb mechanics, examining how the hind leg, pelvic and ankle bones fit and move together in 190-million- to 210-million-year-old crocodylomorph fossils and in modern specimens. He has also incorporated paleoecological studies, which suggest that the early crocodylomorphs spent most of their time on land.

Paleontologists still believe that reptiles progressed from a sprawling gait to an erect one. But if the already-erect early crocodylomorph was not the link between these two postures, says Parrish, the question becomes: What animal was?

— S. Weisburd

Acne drug smooths wrinkles

Within the past few years, scientists have been testing whether an acne treatment containing a vitamin A relative called tretinoin can reduce the wrinkles and discoloration characteristic of sun damage — and thus slow the skin's aging process. Last week, researchers from the University of Michigan Medical Center in Ann Arbor announced the results from the first tightly controlled study of tretinoin's effects on skin aging. As described in the Jan. 22 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, neither patients nor researchers knew whether tretinoin-containing cream or one without the compound was being used. After 16 weeks of treatment, the 30 subjects treated with tretinoin showed "statistically significant" changes in cell growth of forearm skin, say the scientists. The photo on the left is of a cross-section of skin before treatment; that on the right was taken after therapy. The arrow points to a layer of material that, by increasing in thickness, is thought to help tighten and therefore smooth the skin. The underlying layer of



epidermis cells also is thicker, apparently reducing wrinkles. In addition to fewer wrinkles and rosier skin, treated patients had freckle-fading and less of the atypical cell growth that might be related to skin cancer. An editorial accompanying the article, however, cautions that the small study is too limited in scope to determine long-range effects, and that staying out of the sun is still the best medicine.

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