DINOSAURS!

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DRAMATIC DINOSAUR MURAL -- 9′ LONG!

Rudolph F. Zallinger's Pulitzer Prize-winning "Age of Reptiles" mural in the Peabody Museum of Natural History at Yale University can now be a major exhibit in school and libraries, or a spectacular home decoration. Faithfully reproduced on durable plasticized paper, in full color, this fascinating "sweep through time" identifies and blends together a continuous image of life during the age of reptiles. The original, authenticated by experts, took 4½ years to complete. Size overall: 110″ x 19¾″; image size: 108¼″ x 15¼″.

An accompanying 40-page teaching guide includes a fold-out keyed illustration. $2.8. until January 1, 1978. Thereafter, $3.1. Surface mail postpaid. By air, postage and handling per mural: $2. domestic; $3. foreign. See special combination offer facing page.

Peabody Museum Associates, Dept. SN11
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ternal reflection, to the edge of the sheet. There it is reemitted, appearing as a bright glow. As a result, narrow strips of silicon only need to be placed below the edge of the collector, thereby greatly reducing the quantity of silicon-material needed and the cost of the solar collector.

Zewail says the concentrator enhances the efficiency of silicon cells by a factor of three and concentrates the flux of light at the edge of the concentrator, relative to that incident upon it, by a factor of 100.

This may offer a great advantage over the range of Fresnel and other lenses being developed for solar collectors. "Lenses are extremely expensive to manufacture, for each lens must be precisely ground," Zewail says. "By contrast, sheets of this plastic collector material could be mass produced for a fraction of the cost." And "while lenses focus usable light on solar cells, they also focus short-wavelength, high-energy light, which causes excessive heating of the silicon cell, greatly reducing its efficiency," he says. This concentrator eliminates overheating by dissipating heat over the concentrator's large surface area.

Because light from any angle is funneled to the plates's edge, a solar collector using this concentrator can be used even on cloudy days without need for costly equipment to follow or track the sun, Zewail says. There is still much engineering needed before the concentrator will be offered commercially, so Zewail is unwilling to speculate on the eventual cost or date at which it will be available. He said, however, that dyeing the plastic involves no special engineering problems and that the cost of materials involved in its production is "terribly cheap." Zewail and his colleagues in Caltech's chemistry department will soon bègin working with engineers at the Jet Propulsion Laboratory. JPL will "investigate the practical aspects of the concentrator," he says and "do the engineering."

Among problems yet to be worked out are which dyes to use and at what concentrations to obtain optimum optical efficiency in conversion of light to electricity. In addition, Zewail says they plan to "play with the shape of the concentrator," to find the one that most efficiently enhances energy output. JPL plans to investigate ways of capturing dissipated heat to further increase collector efficiency.

In speculating on an eventual application, Zewail says it may be possible to use a window covered with the plastic concentrator to one day power small appliances such as a television. □

David's debut into the world

In 1971, a Houston couple gave birth to a child suspected of having combined immunodeficiency disease—that is, no immune protection whatsoever against infections. Immediately after birth the infant was put in a sterile environment at St. Luke's Hospital in Houston where physicians tested him for the disease. He had it, but the doctors could not give David, as the infant was called, the bone marrow transplant he needed to correct his disease, since he did not have a sibling whose marrow was immunologically compatible with his. Nonetheless, they hoped that marrow transplant registries would eventually identify the ideal marrow donor for him or that some other treatment for his condition might be devised. It was decided that until that time came David should live in a germ-free bubble at the Texas Children's Hospital in Houston, the clinical research center for Baylor College of Medicine.

By 1974, a solution to David's disease had not been found, but he was alive and well in spite of the accidental acquisition of some microorganisms that had leaked into his germ-free environment. What's more, he was not only normal but apparently psychologically advanced for his age (SN: 5/2/74, p. 335).

Now, at age six, David is still waiting for a cure for his disease, living six weeks in his bubble at Texas Children's Hospital and six weeks at home in a portable isolator. He has lived in a germ-free environment longer than any other person in history. However, he has experienced some changes in his immune system that might possibly indicate the natural development of some immune responses. He continues to develop exceptionally well psychologically, studying mathematics, reading, social studies, language skills, art and music. He excels in memorization, vocabulary and imagination. David is now making his debut into the world outside his isolator for the first time, courtesy of a germ-free suit unveiled to the press last week.

Texas Children's Hospital

Four years ago, scientists at the National Aeronautics and Space Administration's Johnson Space Center near Houston and at the Baylor College of Medicine began investigating the possibility of using space age technology to help David stay infection-free while participating in schoolwork, social interactions, physical education and group

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play. They thus devised a miniature "space suit" attached to a pushcart air support system.

The basic design of the suit was already available from the Apollo lunar missions. The suit resembles the isolator garment worn by the astronauts during quarantine after their return to earth. The suit body is made from fabric similar to that used in life rafts. It has form-fitting rubber gloves and shoes and is topped by a clear plastic bubble for the head. Air exhaust vents are located in the pants legs. Two tubes are attached to the suit—one through which David crawls from his bubble environment into the suit and which then collapses and is stored on the pushcart, and another that provides filtered air from the pushcart to the suit. The pushcart also contains a seat on which David can ride.

So far David has made three test runs in the hospital wearing his new suit. His family, NASA representatives and the hospital staff directly responsible for his care have been present. He has ridden down corridors and up elevators, eager to see offices and bathrooms. He has poked his head into refrigerators and other patients' rooms for the first time, has run errands for his favorite nurses, has performed schoolwork for his teacher in a hospital classroom, has tossed and caught a ball and has roughhoused. He particularly likes the small gloves that allow him to manipulate objects and tools easily. Thanks to the suit, he has been able to hug his parents and sister for the first time in his life.

Future trips in his space suit may include the zoo, a fire station and NASA. He does not yet know the world outside the hospital or his home, let alone the vast spaces that have made development of his unique suit possible.

David's care has been supported since birth by grants from the National Institutes of Health, by the Texas Children's Hospital and by many individual donations. His $20,000 space suit, contributed by the NASA Johnson Space Center, may also benefit other younsgers such as leukemia patients, who need short-term protection from germs. □

Wisconsin speed trap

The Wisconsin State Board of Medical Examiners recently declared a ban on the sale and use of amphetamines. The ban is designed to stop the drugs' usage as a dietary agent, but amphetamines may still be used in such special cases as brain and emotional disorders, and for research.

"We now have an abundance of evidence that amphetamines are worthless for weight control," Irving Ansfield, Milwaukee physician and board member, told SCIENCE NEWS. "They depress the appetite for only 10 days to two weeks, and then all you've got is chronic intoxication and a persistent increase in metabolic activity. It's physiologically addicting. To get to sleep you've got to start taking barbiturates—and they're even more dangerous."

The Wisconsin ban may have already catalyzed other extra-legal action. Three days after that announcement, physicians and pharmacists in Miami, Fla.—where an estimated 1 million doses were sold last year—decleared amphetamines would no longer be available in that community. □

Second surgical opinions

Concerned over "intolerably high levels" of unneeded surgery, federal health officials have decided to reimburse Medicare patients for second medical opinions before surgery. Health, Education and Welfare Under Secretary Hale Champion told the House Oversight and Investigations Subcommittee on Nov. 1 that "there is too much" unnecessary surgery all over the United States.

He cited statistics showing that the nation's overall surgery rate increased by 25 percent between 1970 and 1975.

Champion testified that HEW's decision to pay for second, and in some cases third, medical opinions was part of a "major effort" to reduce surgical procedures. HEW has also asked the nation's 182 "professional standards review organizations"—groups of doctors who monitor hospital admissions—to move aggressively into reviewing surgical procedures. HEW strongly recommends that medical schools "cut back significantly" on the number of surgeons trained at public expense, since surgeons "expect a surgical approach to medical problems," and "excess surgeons lead to excess surgery." □

Pioneer 11: An 'inside' vote

Pioneer 11 scientists and project officials have voted "overwhelmingly" in favor of sending the Pioneer 11 spacecraft inside the rings of Saturn at its 1979 encounter with the planet, rather than targeting it for a possibly safer course outside the rings. The final decision, however, will be made late this month by NASA management including Noel Hinners, associate administrator for space sciences.

The vote resulted from feelings about "the uniqueness of the *in situ* particles and fields measurements" that would be possible during the "inside passage," although there is considerable feeling that the spacecraft may not survive the crossing through an additional ring that may lie inside the primary ring system (SN: 10/15/77, p. 249). The inbound half of an inside encounter, in other words, may be worth more than a complete encounter outside. Officials with Project Voyager, however, whose two spacecraft will pass outside the rings in 1980 and 1981, hope that NASA will decide to have Pioneer 11 go outside "to scout the way." □

MAMMALS!

SPECTACULAR MAMMAL MURAL -- 9' LONG!

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After the Dinosaur came the Mammal Age, covering six epochs from Paleocene through Pleistocene. Its myriad bizarre animal and vegetable life has been reconstructed in a fascinating "sweep through time" by the renowned Pulitzer Prize-winning artist, Rudolph F. Zallinger. The mammoth 60' mural in the Peabody Museum at Yale University is now available in a full color reproduction, on durable plasticized paper, as a unique exhibit in school, home or office. An accompanying six-piece post-card reproduction describes the life pictured in each epoch of the age. The reproduction itself identifies the mammals and plants depicted. Still $28, postpaid in Continental U.S. Size overall: 109 7/8" x 15 1/16"; image size: 107 7/8" x 9 1/8".

Limited 2-Mural Offer:
You may order both the Dinosaur and Mammal murals at the combined rate of $50. until Jan. 1, 1978. (January 1978 Mural prices: Dinosaur, $31; Mammal, $29; in combination, $55.) All rates include handling and surface mail paid. By air, add per mural: $2. domestic; $3. elsewhere.

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