BIOMEDICINE

The battered child and glaucoma

A nine-week-old infant was examined at Washington, D.C., General Hospital, then at Georgetown University Medical Center because of "funny eyes." At first, doctors thought he had congenital glaucoma—the building of pressure in the eyeballs that stemmed from birth. Other evidence, however, suggested that the purported glaucoma in the infant's eyes was not congenital at all, but inflicted by trauma, specifically by child abuse by his 17-year-old unwed mother. She finally admitted to gross neglect of the child. Consequently the child was turned over to a foster mother. Medical treatment has restored his vision. He no longer cries constantly and has learned how to smile.

This, the first reported case of glaucoma induced by child battering, is described in the May ARCHIVES OF OPHTHALMOLOGY by Stanley S. Tseng and Marshall P. Keys of Georgetown. Cataracts, retinal detachments and other eye injuries stemming from child abuse have been reported before.

"The ophthalmologist should be on the alert for possible child abuse cases, for he may occasionally be the first one to care for such patients and eventually save them from disability or death," Tseng and Keys conclude.

Lung disease from the ocean

Mycobacteria, microorganisms resembling the tuberculosis bacillis, are important sources of chronic lung infections in people, ranging from the mild to the fatal. Americans along the seacost from Virginia to Florida and along the Gulf of Mexico are particularly vulnerable. Howard Gruft of New York State Department of Health in Albany wondered whether mycobacteria might therefore come from the ocean.

First, he noted that mycobacteria can survive in ocean waters for long periods of time. He identified mycobacteria in samples of water collected off the Georgia coast. He then found that mycobacteria in ocean water can be released into the air through droplets, which are capable of being carried inland and small enough to penetrate the tiniest airways of the lung.

So ocean water and sea breezes may be a source of mycobacterial infections, Gruft concluded last week at the annual meeting of the American Lung Association in New Orleans.

More than skin deep

Contrary to popular belief, even among doctors, the skin is a highly complex organ and vulnerable to toxic chemicals that get inside the body. So declared Jerome L. Shupack, a New York University School of Medicine pharmacologist, last week at the Third Conference on Cutaneous Toxicity, sponsored by the American Medical Association and the Society of Toxicology in Washington.

Some 20 square feet of skin weighing about 10 pounds drapes the average adult human body, Shupack explains. This extensive skin is in turn composed of three layers—the epidermis, dermis and subcutaneous. The epidermis contains pigmentation that gives skin its color. The dermis includes sensory receptors, collagen, sweat glands and hair follicles. The subcutaneous layer is mostly fat cells. Any of these structures can be targets for toxic compounds in the body.

Whether these structures succumb or not, though, depends on various factors—temperature, humidity, radiation and biological rhythms, as well as the skin's own defenses against toxic chemicals. During the past several years, scientists have found that the skin contains the same foreign chemical-metabolizing enzymes that the liver contains. Whether the skin offers anywhere near the same protection against systemic toxic chemicals that the liver does, however, remains to be determined.

ENERGY

Soviet supply problems

Soviet planners may now see energy supply as a bottleneck restricting their country's economic growth, and as a consequence they appear to be shifting emphasis from oil and gas to coal and nuclear energy. They also are relying more heavily on Western technology.

These are the conclusions of Philip Hanson, writing in the May 6 NATURE, saying that although the Soviet Union has "the most impressive known endowment of nonagricultural natural resources" in the world, exploitation of their fuel reserves is lagging. One major problem is geography—the Soviet Union's greatest oil and gas fields lie east of the Ural mountains, isolated from the principal users in the western part of the country. But Soviet industry has been unable to produce a long list of critical items necessary for opening new fields so that at least three-quarters of their latest 20,000-kilometer pipeline was made from imported Western pipe.

The next Five Year Plan calls for shifting oil and gas to "technological" uses, such as industrial feedstocks, while increasingly producing electricity from coal and nuclear reactors. (The Plan indicates a quadrupling of installed nuclear capacity.) But the use of more Western technology also appears necessary, and Hanson notes that on March 31 the Soviet Union entered an agreement with the United States and Japan to drill for gas near Yakutsk.

Britannia to rule the waves

With what might charitably be called a bracing climate, Britains have given little consideration to solar energy. Thus when the British Department of Energy recently announced the nation's first major commitment to "alternative" power sources, not surprisingly the nod went to a form better suited to the island environment—wave energy.

Over the next two years, £1 million will be spent on four wave power systems, two mechanical and two hydraulic, described in the May 6 NEW SCIENTIST. The most advanced of these was developed at Edinburgh Universtiy by Stephen Salter. It is called the "Salter duck"—perhaps because the device looks like a string of toy ducks bound side by side. As each individual "duck" rocks back and forth, the motion is transformed into electricity or hydraulic pressure. The other mechanical device was developed by Sir Christopher Cockerell, who invented the hovercraft. It consists of flexible rafts whose bending can be used to drive internal motors or pumps.

One of the hydraulic devices, called a "wave rectifier" was also developed in Britain. It allows wave crests to pour water into an upper chamber and troughs to allow it to run out of a lower chamber—driving a turbine in the process. Finally one Japanese design, the "oscillating water column," is also under consideration. Here, passing waves set up oscillations in an inverted container, driving a turbine.

How the Swedes save energy

Though it has achieved the highest per capita gross national product in Europe, Sweden requires only 60 percent as much energy for each GNP dollar as the United States. Lawrence Berkeley Laboratory conducted a study to find out how, and arrived at some interesting conclusions:

- Swedish homes and buildings are heated twice as efficiently as in the United States.
- Their industry uses 25 percent less heat energy per ton of output.
- Swedish cars average 24 miles per gallon and mass transit is widely used in the cities.