

# When at The Beach, Watch Out for Bears

If you're heading to the beach this summer, be sure to watch out for sunburn, sand flies, sharks, water bears and mud dragons.

Water bears? Mud dragons? Well, to be perfectly honest, these critters won't hurt you. And you can't really "watch out" for them because you can't see them, even though they're everywhere - in fact, they're right beneath your very feet.

"There's a whole other world of animals living just a fraction of an inch beneath your feet - all kinds of creatures inhabiting the spaces between the grains of sand," says Dr. Robert P. Higgins, a zoologist at the Smithsonian's National Museum of Natural History, who specializes in these microscopic denizens of the sand. "Why, in just a few handfuls of sand, there are millions of them!"

There are, for instance, water bears, more properly known as tardigrades, and mud dragons, Higgins' affectionate name for animals known as kinorhynchids (rhymes with rinki-dinks). And there are worms-nematodes and polychaetes (rhymes with beats) - as well as miniature crustaceans and animals with the tongue-tying name of gastrotrich (rhymes with stick). It's a world where very small is beautiful, where an animal the size of a pinhead would be a giant indeed.

Until the 1920's, scientists knew almost nothing about the curious animal world living in the water that fills the spaces between grains of sediment and sand in the world's oceans, seas and beaches.

"That's not really so surprising," Higgins says, "since the average inhabitant there is only one-hundredth of an inch in length, almost impossible to see without a microscope. Many of my colleagues accuse me of working with mythological beasts."

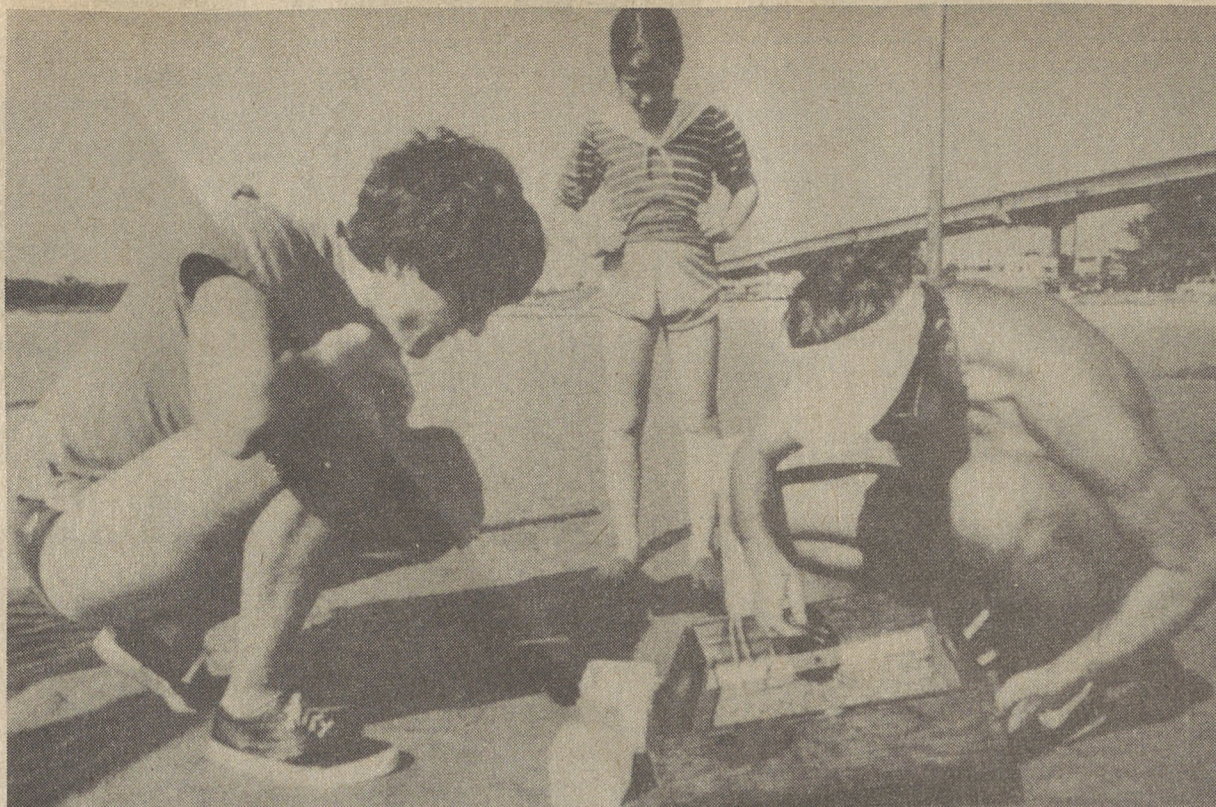
Collecting and studying these sand-dwelling creatures is a challenge worthy of a mythological hero. In addition to their tiny size, the creatures are exceptionally well adapted to their environments and are not particularly willing to leave their cozy homes.

Most of them have a distinctive method of attaching themselves to the hard surfaces of the sand. Gastrotrichs, which resemble slightly flattened worms, are loaded with adhesive organs that can quickly secrete a sticky substance for clinging and just as quickly secrete a solvent to release the animal.

The tenacious tardigrades have either spoon-shaped adhesive toes or complex claws for grasping. Armed with their four pairs of short, stubby legs, the clawed varieties of tardigrades look very much indeed like miniature bears when viewed in profile. Kinorhynchids also have pairs of adhesive organs on the underside of their cylindrical bodies, just below their "tassel"-shaped heads.

Higgins has collected water bears and mud dragons in beaches and ocean floors all over the world, including India, Madagascar, Greenland, China, the United States, the Caribbean, the coast of Brazil, northern Europe and the Mediterranean region.

The elusive water bears live primarily in beaches, which are really just an extension of the ocean floor. To collect a sample of these beach-dwellers, Higgins



## Digging for Worms

They may not always find the worms they're looking for, but Smithsonian scientists Kristian Fauchald, right, and David Russell, left, are sure to pick up a curious onlooker as they have here.

needs only a shovel and a pail - and a bit of muscle. After digging a bucket of sand, he swirls a few handfuls around in fresh water for about 20 seconds, subjecting the creatures to an "osmotic shock" that forces them to lose their grip. The water is poured through a fine filter to collect the tardigrades, among the smallest of the multicellular microscopic creatures.

Kinorhynchids, on the other hand, most frequently dwell in the oceans and collecting these calls for more ingenuity and a ship. For the past year, Higgins and his research assistant, Marie Wallace, have been making collecting expeditions along the mid-Atlantic coast of Florida aboard the R-V Turlops, an ocean-going research vessel owned and operated by the Florida Institute of Technology.

In one collection method, a sampling device is lowered carefully onto the bottom of the ocean floor while the boat is stationary. When brought back to the surface, the sediment in the sampler is cut into "cores." These "cores" are then studied layer by layer, yielding information on the density, abundance and position of the kinorhynchids in their habitat, as well as the size and makeup of the sand particles.

In another method, a device is dragged along the ocean floor while the boat is moving. This "dredge" sample delivers up vast quantities of kinorhynchids

creatures have a very powerful ability to withstand extremes in temperature and other environmental conditions," Higgins explains. "In a dried state, they can survive temperatures well below freezing and as hot as boiling water, and they can be revived within 30 minutes, even after years of existing in what is essentially a state of 'suspended animation.' Well, when early biologists first described these animals they used the word 'resurrection' when referring to their ability to revive after severe drying. That led to quite a ruckus in the church!"

Even today, very little is known about these and other microscopic sand inhabitants, but Higgins believes that most feed primarily on even tinier plants and organic matter. In turn, the animals contribute to the food chain by serving either directly as food for higher marine organisms or by supplying digested organic nutrients to these organisms.

He also believes that scientists can use these organisms as a tool for detecting environmental changes, since the animals live just below the surface of the sand where pollutants are likely to accumulate. "These creatures are a whole new biological frontier," he says. "Even though biologists have been studying the oceans for hundreds of years, we're just beginning to learn about these microscopic animals and their incredible adaptations and lifestyles."

study.

Higgins accidentally discovered one of the most effective methods for collecting kinorhynchids when he was a graduate student at the University of Washington. While working in his lab one day, he noticed that a paper towel had fallen atop a bucket containing a sample of mud and water. "A lot of 'stuff' seemed to adhere to the towel," he recalls, "and when I washed the towel and collected the 'stuff', I counted more than 300 kinorhynchids - probably more than anyone had ever seen at a time!"

This method continues to serve him well, with a few minor adaptations. Using a portable bicycle pump, he bubbles air through samples of mud, sand and seawater, collected usually from the ocean floor. The kinorhynchids are trapped in the tiny bubbles and rise to the surface. After the sediment settles, he blows the surface with a piece of copier paper and washes the paper onto a special filter, thus collecting the microscopic creatures. The beauty of this method is that it can be used anywhere.

There are now some 150 known species of kinorhynchids and 600 species of tardigrades, living in oceans and beaches all over the world. "And more are being found all the time," Higgins says. He should know - he's the world's only expert on kinorhynchids and one of a handful of experts on tardigrades.

"There are doubtlessly hundreds, even thousands of additional species, waiting discovery," he says. "Everywhere people have looked, they've found these critters." On a recent trip aboard the Turlops, Higgins discovered 10 new species of kinorhynchid and twice as many new tardigrade species, including one species that represents a whole new scientific family of water bears.

Even if they were not so numerous and plentiful, these animals would be considered interesting, if not downright courageous, for their perseverance in the face of adversity. Consider for a moment their inhospitable homes: Wind, waves and currents - not to mention people walking all over them - cause a continuous rearrangement of the particles in the surface layer of the sand. Temperature and salinity vary greatly with the tides and seasons. Yet these creatures thrive because of their superb adaptations to such conditions.

Many of these animals have scales or spines or other appendages, as well as the ability to contact rapidly to protect them against shifting sands. Nematodes, or round worms - among the most abundant creatures living in the sand - may have rings of hardened skin to protect them against the crushing action of the sand grains. A typical kinorhynchid, which is unable to swim, moves by protruding its spine-covered head and using its adhesive glands and body spines to prevent accidental removal from its home. Then, by using longitudinal muscles, the animal retracts its head and pulls its trunk forward. By repeating this process, the kinorhynchid creeps along - from one tiny space to another.

In the 18th century, one of the tardigrade's innovative adaptations led to controversy. "These

## WWV Eliminates Bus Stops

Dr. Ellwood B. Jacoby, Superintendent of Schools, Wyoming Valley West School District, has announced that certain bus stops will be eliminated in the district's transportation schedule for the coming 1983-84 school year.

The bus stops eliminated as well as schools and students affected are listed below.

For students of Grades 9 through 12 attending West Side Area Vocational-Technical School, these bus stops will be eliminated: Courtdale Avenue-Hoyt Street, parking lot on High Street in Edwarsville, and Pringle Street School in Kingston.

Bishop O'Reilly High School students Grades 7 through 12 will not have a school bus stop at the Pringle Borough building and the parking lot on High Street in Edwarsville.

These bus stops will be eliminated for students of Grades 3 through 5 attending Dana Elementary Center in Forty Fort; Durkee Street School in Forty Fort; Hemlock Street School in Swoyersville, and the Slocum and Church Streets stop in Swoyersville.

The Loveland Street, Kingston, bus stop has been omitted for students of grades 3 through 5

assigned to Third Avenue Elementary School in Kingston.

The Rutter Avenue School bus stop for gifted students of Grades 3 through 5 attending Chester Street Elementary School in Kingston has been eliminated.

All other bus stops are the same as last school year's schedule. The bus schedule for students of kindergarten through Grade 2 is unaffected.

Parents with questions concerning the elimination of bus stops are advised to contact the Wyoming Valley West School District Administrative Office.

## Logging Safety Field Day Planned

The Pennsylvania Forestry Association, in cooperation with the Northeastern Pennsylvania Logging Safety Field Day Committee, will sponsor the Third Annual Northeastern Pennsylvania Logger's Safety Field Day, July 23.

The Logging Safety Field Day will take place at the Bartron Supply Company field off P.A. Route 92, one-quarter mile south of Tunkhannock. Registration for the competitors is 10:30 a.m. to 12 noon. Competition begins at 12 noon.

The primary purpose of the day is to show, in competition form, the elements of logging safety in the woods and to show how they relate to the everyday life of a professional logger. Many of the activities will also be of major interest

and value to weekend loggers. The program is free and open to the public.

General Chairman for the Third Annual Northeastern Pennsylvania Loggers Safety Field Day is Phil McCarthy, a professional forester working out of Proctor & Gamble's Mehoopany plant. McCarthy works closely with many loggers in his assigned area of responsibility and, has seen improved signs of safety awareness since this event was started in 1981.

Four contests have been established for the PFA Sponsored Safety Field Day. They include logging competition in loading, felling and skidding of trees, and log truck safety showmanship which is judged with the help of the Pennsylvania State Police.

These contests are restricted to professional loggers and sawmillers, but the field day itself is open to the public.

The contests have been designed to illustrate maintenance of equipment, steady and accurate work habits, safe job procedures and the least emphasis will be placed on speed and time. Cutting techniques in felling will be of major importance to non-professionals.

Anyone interested in more information or in obtaining a copy of the rules for the competition for the July 23, Loggers Safety Field Day may contact: Phil McCarthy, Chairman, Loggers Safety Field Day, Proctor & Gamble Paper Products Company, P.O. Box 32, Mehoopany, PA 18629. Phone: (717) 833-5141.



Dallas Post/Bill Savage

### Teamwork

Two members of the Back Mountain Soccer League display their form in last week's 2-0 victory over the Abington Soccer League at the Grove Street Stadium.

## Postal Service Cracks Down on Charities

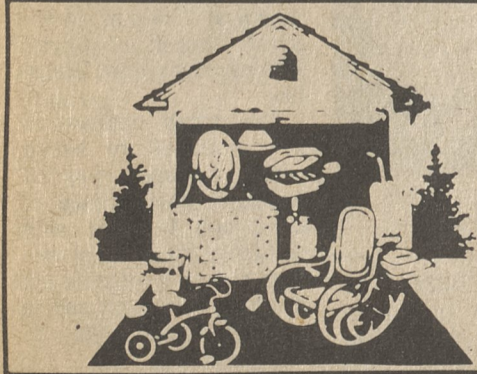
Secretary of the Commonwealth William R. Davis today announced the beginning of a "spirit of cooperation" between the Commission on Charitable Organizations and the U.S. Postal Service to crack down

on fraudulent charities soliciting in Pennsylvania.

The cooperation allowed charities commission Director James Maxey to participate in a recent Postal Service investigation resulting in a

temporary restraining order being issued to the Special Olympics Fund of Exton.

The Special Olympics Fund was soliciting mail contributions.



# HAVING A GARAGE SALE?

We'll help you write a better classified ad for a more successful sale.

Just call us!  
675-5211  
DALLAS POST CLASSIFIED

**LEGAL NOTICE**  
NOTICE IS HEREBY GIVEN that Letters Testamentary have been granted in the Estate of Ethel A. Griffin, late of the Municipality of Kingston, Luzerne County, Pennsylvania, who died on June 10, 1983. All persons indebted to said estate are requested to make payment and those having claims or demands to present the same without delay to Margaret Bonham, Executrix, c/o John E. Morris, III, Esquire, 126 South Franklin Street, Wilkes-Barre, Pennsylvania 18701. 27-3-P

### GARAGE SALE

Multi Family Sale--20 Dorchester Drive., O.V.T., Dallas, July 22 & 23, 10-5 p.m., children and adult clothing, toys, tools, dresser, household items. 27-1-P

### TILLERS

Troy Bilt Tillers--Below factory prices, all models in stock, free demonstrations. Homestead Equipment Co., Fleetville, (717) 222-3635. 6-tfn-P

### SERVICES

Minor Body Work--Done reasonable. 829-6340 ask for Joe. 25-4-P  
Stumps Removed!--No mess. A couple of wheelbarrows of topsoil and you're ready to re-seed your lawn. Also tree trimming & removal. 829-2595. 27-tfn-P

E & C Painting & Paper-hanging--Interior-exterior painting. All work guaranteed. Reasonable rates 822-3878 after 5 p.m. 27-1-P

### SERVICES

Harry Ashford Plastering--Complete or patchwork, swirl ceilings, paint work. I do small and big plastering jobs. 30 yrs. exp., Ref. furnished 823-5583. 27-4-P

### WORK WANTED

Work Wanted--Hate to sew - I love it. Will construct, alter or repair any of your sewing needs. 696-4432 after 6 p.m. 24-4-P

Work Wanted--Painting-interior and exterior, 30 yrs. exp. One man operation. Call evenings 288-4339. 25-10-P

Work Wanted--College student desires yard work and odd jobs. Ask for Steve. 675-4451. 27-4-P

### WORK WANTED

Odd Jobs Wanted--Will do almost anything, painting, grass cutting, gardening, mechanical work etc. Call 288-1246. 22-8-P

### HELP WANTED

Wanted--secretary with law office experience or equivalent legal secretarial education. Competent shorthand and typing required. Reply to Box P.O. Box 366Z, Dallas, Pa. 18612. 24-tfn-P

Part Time Job--possible \$2000 and bonus, approx. \$4.78 per hour to start. Earn while you learn. Contact National Guard Rep. 654-6096. 27-1-P

### HELP WANTED

Help Wanted--High school girl to babysit in Dallas Area. 675-6498. 25-4-P

Help Wanted--Woman to babysit in my home beginning Sept. 3 days per week. School hours in Dallas. 675-0094. 27-4-P

Help Wanted--Live in companion for elderly couple. Most daytime and night free. Private room and bath, air conditioned Back Mountain Estate. Room and board plus salary. Call 288-6638. 27-2-P

### RECREATION

1979-19' Master Craft Ski Boat--351 inboard engine. Call 388-6576 after 6 p.m. 19-tfn-P

### RECREATION

Champion Motor Home--Self contained, sleeps eight, a-c., furnace, auxiliary engine on 1973 Dodge chassis, good body and tires, exc. cond. \$6500. 779-4123 after 6 p.m. 18-tfn-P  
'77 Starcraft Galaxie 8 Pop-up Camper--sleeps 8, equipped with electric-gas refrigerator, gas furnace and stove, awning. Used 4 times. Asking \$3,000 or best offer. 639-5914. 19-tfn-P

Frolic Cat--12' Fiberglass Catamaran with double well cockpit for 2 to 3 passengers (only 200 specially made). Ideal for lake or bay sailing. Best offer over \$495. 639-5612 or 823-8717. 21-tfn-P

### RECREATIONAL

Boat for Sale--1972 15 ft. Glastron with 85 h.p. Johnson. \$1500. Call 696-2539. 10-tfn-P

1953 Criss Craft boat, many spare parts for sale. Call for details between 5 and 7 p.m. 693-2785. 12-tfn-P

16 Ft. Comet Sailboat--registered for racing, mamsail and jib, set of extra sails. Trailer included, \$1500. Phone 474-9716 22-tfn-P

17' Inboard Boat in good cond. with trailer. \$1795. after 4 p.m. 654-8841. 24-tfn-P

## Post Deadline: Friday Noon