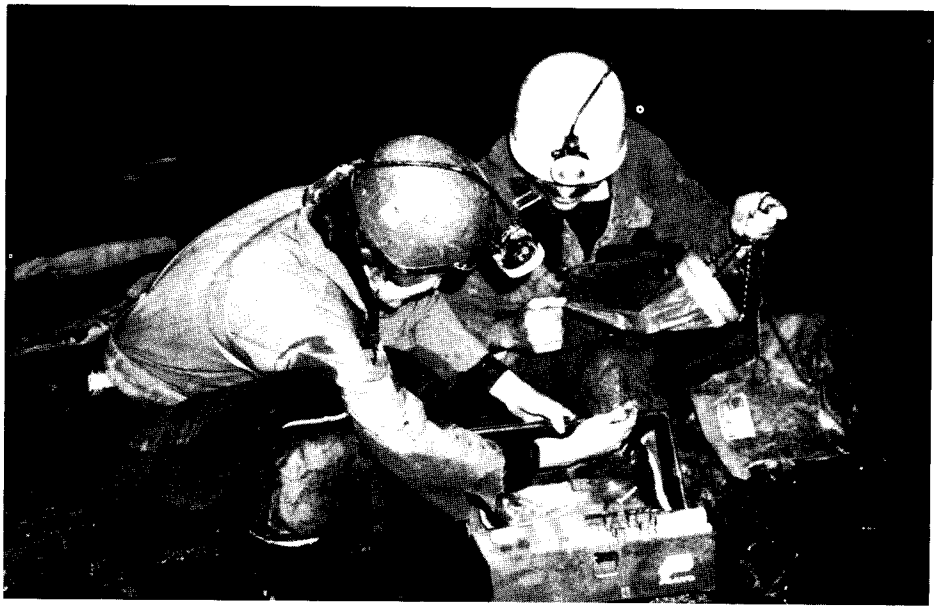


Cave Dwellers

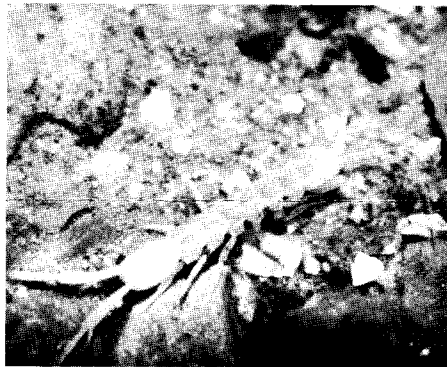
More than 50,000 species are native to Illinois, including more than 29,000 species of insects and other invertebrates, thousands of plants, about 300 birds, more than 180 fishes, and 67 mammals. Among the native species that dwell on the surface (rather than underground), only two types of crayfish and two vascular plants are endemic (occur naturally only in Illinois). Thus, all but four of the tens of thousands of surface-dwelling species have been able to move or disperse across the Illinois border.

For species that live underground, however, moving across state lines apparently is not as easy. Of the more than 215 invertebrate species that live in caves or other groundwater habitats in Illinois, at least eight are endemic. These endemic species are special not only because they are unique to Illinois but also because they serve as natural biological indicators of groundwater contamination: the more contaminated the water, the less healthy the underground populations.

The subterranean endemics—three aquatic crustaceans (one isopod and two amphipods), three millipedes, and two beetles—are often found only in one or two caves or springs in Illinois. For example, one of the two endemic beetles (*Pseudanophthalmus illinoisensis*) is known only from one cave in Hardin



Survey researchers are studying the animals that inhabit Illinois' caves in relation to groundwater quality.



Endemic underground animals such as this blind, aquatic isopod are severely affected by groundwater pollution, such as that from pesticides and sedimentation.

County, and one of the amphipod species (*Caecidotea lesliei*) has been collected only once, from a drain tile located in McDonough County.

The geographic ranges of endemic subterranean species in Illinois have been strictly controlled by a number of factors, including geology and past events of isolation (that is, ice ages). The isolation of Illinois' endemic subterranean species began perhaps 20,000 years ago with the retreat of the Wisconsinan glacier, which led to warmer and drier conditions in what is now Illinois. Subterranean species, accustomed to cool, moist envi-

ronments beneath the ice, were subsequently limited to inhabiting caves and other groundwater environments, from which it became difficult to disperse to other locations.

Protecting these groundwater environments from pollution is important for conserving the endemic subterranean species; it is also important for safeguarding human health because 75% of the nation's cities and 95% of our rural areas use groundwater as a source of drinking water. Nevertheless, pollution of cave streams and other groundwater sources has become more and more evident, threatening human health and well-being. Despite legislative efforts to protect our precious natural resources, sewage, industrial wastes, agricultural fertilizers, pesticides, and other substances toxic to humans have been found in Illinois' groundwater.

Populations of endemic cave invertebrates and other subterranean aquatic life can be thought of as "biological barometers" that provide warnings about the deteriorating quality of our groundwater resources. The current condition of our groundwater is reflected in the fact that the isopod and one of the two amphipods endemic to caves and

groundwater habitats in Illinois are listed as endangered species by the Illinois Endangered Species Protection Board. Further monitoring of populations of endemic and other species of aquatic subterranean invertebrates will aid scientists in determining the extent and seriousness of groundwater pollution. Such information is vital for protecting our precious water resources as well as our own health.

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