may be a change of electrical charge on the cell membrane during cathodal and anodal stimulation. The cause of this electrotonically induced relaxation awaits further study, but this experiment presents some indication of the effect of electrochemical processes in muscle relaxation (*7*, *8*).

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Environmental Significance of Palynomorphs from Lower Eocene Sediments of Arkansas

Abstract. Spores and pollen present in sediments of the lower Eocene Wilcox group in south-central Arkansas are mixed temperate and tropical genera. The source area is postulated to have been temperate highlands adjacent to a tropical coastal plain. A similar interpretation based on plant megafossils has been made. Hystrichosphaerids and dinoflagellates found in the sediments suggest a depositional environment of brackish water.

One of the most extensively studied fossil floras is that present in the sediments of the Wilcox group, lower Eocene in age, in the Gulf Coastal Plain. This flora has been studied by paleobotanists including Lesquereux (*1*), Berry (*2*, *3*), Ball (*4*), and Brown (*5*). Berry conducted the most extensive study, describing 543 species from 180 genera and 82 families. After considering the corrections and additions to Berry's work, Sharp (*6*) listed 137 genera from the Wilcox flora ". . . whose taxonomic position is known with more or less exactness."

There has been considerable speculation about the environmental significance of this lower Eocene flora. Berry (*2*) considered the flora to be tropical and noted that there were no strictly temperate genera. He speculated, however, that ". . . the Wilcox flora probably seemed to be more tropical in character than it really was." Berry also noted the absence of an accompanying brackish water fauna that he believed should have developed in the upper part of the Mississippi Embayment during the lower Eocene.

Brown (*5*) and Sharp (*6*) interpreted the Wilcox flora as being more temperate in nature than did Berry. They pointed out the presence of a number of temperate genera in the flora, including *Betula, Comptonia, Fagus, Sassafras,* and *Staphylea.*

Sharp (*6*) compared the fossil flora of the Wilcox group with the modern floras of a number of regions. He found that some 60 percent of the genera described from the Wilcox sediments still persist in the southeastern United States, the area in which Wilcox sediments were deposited. Thirty of these genera are, however, restricted to Florida. Sharp stated that approximately 53 percent of the Wilcox genera are present in the present flora of central and eastern China. He found the greatest degree of similarity between the Eocene Wilcox flora and that now present in eastern Mexico, an area of high mesas and neighboring coastal plains. Some 68 percent of the Wilcox genera are present in this area.

Two genera, *Quercus* and *Pinus*, which are important elements in the Mexican flora, had not been reported from the Wilcox sediments when Sharp conducted his study. Despite the absence of these two genera in the Wilcox flora, Sharp concluded that the environmental conditions in the Gulf Coastal Plain during the lower Eocene were essentially like those of eastern Mexico at present.

A recently completed palynological study of sediments from the Wilcox group in central Arkansas (*7*) disclosed the presence of 62 spore and pollen types, including both *Quercus* and *Pinus*. The study is based on 60 samples collected from outcrops of the Wilcox group in Pulaski and Saline counties. From this area Berry had described only 12 genera of megafossils. The pollen of *Pinus* is a common constituent of the microflora, present in amounts ranging up to 10 percent of the total forms in some samples. *Quercus* pollen is less common but is present in most of the samples that were analyzed.

The 62 spore and pollen types found in the Wilcox sediments are a mixture of temperate, subtropical, and tropical genera. These include genera such as *Carya, Engelhardtia, Myrica, Manilkara, Symplocos,* and *Anacolosa.* The environmental interpretation of a warm, humid coastal plain with adjacent highlands, such as Sharp described for eastern Mexico, is thus supported by both the megaflora and the microflora. Hystrichosphaerids and dinoflagellates are also present in small numbers in the samples. These fossil groups, considered significant of marine or brackish-water environments, support Berry's postulation that the plant remains and the enclosing sediments were deposited in a brackish-water environment.

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Hole Drilling by Octopus

Abstract. Octopus bimaculoides and *O. bimaculatus* can drill holes in the shells of their molluscan prey, through which they appear to inject a paralyzing venom.

Octopuses are found among the marine littoral fauna throughout most of the world. Because of their appearance, edibility, and behavior, they are well known to maritime peoples. It has long been known that a large part of the food of the octopus consists of shelled mollusks (*1*). The suggestion has been made that the octopus obtains this food by exerting greater force than the prey can withstand. Bartsch (*2*), writing of *Octopus vulgaris* Lam., says, "Presumably he opens a mussel by attaching some of his suckers to the two valves of the shells and then applying pressure until the valves give way." Phillips (*3*), discussing California species of octopus, states that "abalone divers tell of occasionally finding an octopus patiently exerting pressure on an abalone. The abalone eventually tires, even as an oyster gives in to a starfish. The octopus can also open mussels in this manner."

The investigation reported here was prompted by the observation that the empty shells of small abalones appear-