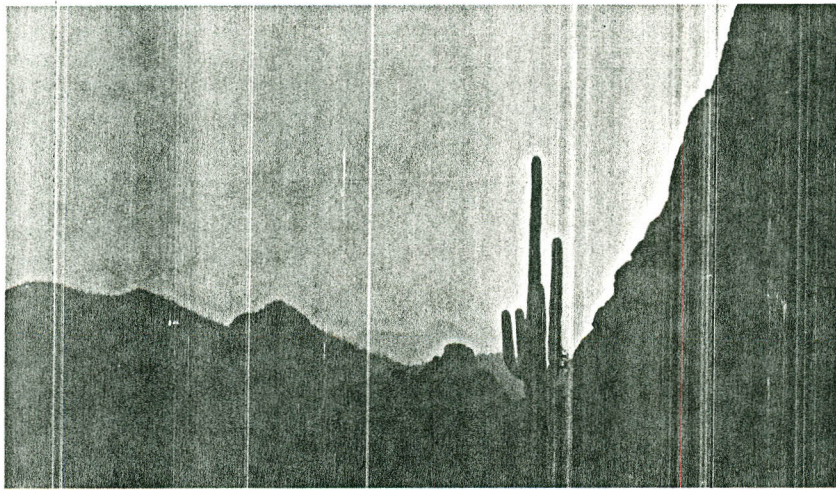


The odds against its survival are enormous,
but somehow this statuesque plant
still reigns supreme in the Arizona desert

Saguaro, king of the cactus



Defying the desert elements, a mature saguaro rises some 30 feet above a barren hillside. The slow-growing species seldom sprouts arms before the age of 75. A sign of new growth, the cottonlike balls on this cactus (right) will dry up, while the spines will harden and ward off nibbling animals. **Overleaf:** A saguaro forest often flourishes on a rocky slope, where the runoff from sporadic desert rains collects.

BY BARBARA J. BIGHAM

INDIAN lore has it that an ancient deity once "planted" a bead of perspiration on the desert soil. From that droplet sprouted the most awesome plant in the desert: the giant saguaro. But to keep the cactus alive, periodic moisture was needed. So every summer, for hundreds of years, the Papago Indians of southern Arizona have harvested the fruit of the saguaro to make a fermented juice for a traditional rain-making ceremony. Whether that ancient ceremony has anything to do with the Southwest's fleeting summer rains is open to question. One thing, however, is certain: the mighty cactus needs all the help it can get these days to keep on flourishing.

Many people don't realize that cacti are almost solely New World plants.

Although there is a larger species in Mexico, the saguaro is indisputably the plant king of U.S. deserts. With its long, tentaclelike arms weaving up to the sky, the saguaro may live for nearly two centuries, weigh almost ten tons and grow up to 50 feet high. And that's only half the story.

Below ground, a network of shallow saguaro roots may sprawl over an area almost 100 feet in diameter. Its enormous bulk is supported by an interior of tough wood ribs, while its expandable skin can double its girth during the rainy season. It is not unusual for a mature saguaro to soak up more than 200 gallons of water during a single storm, enabling the plant to survive later during periods of drought. Despite their adaptability, however, few saguaros ever achieve their maximum proportions. In recent years, cac-

tus poaching, cattle grazing and urban development have all taken their toll of seedlings. But the greatest obstacle to their survival remains the harsh desert environment itself.

A saguaro requires the heat of the desert to live, yet it often cannot survive the frigid nights that are common there. It needs the moisture of seasonal rains, but it will rot if it receives too much moisture. It demands plenty of light, but it will die during infancy without shade. These conflicting requirements have limited the distribution of this mighty green giant considerably. In the entire world, the saguaro exists only in a small area of the Sonoran Desert in southern Arizona and northern Mexico. Even here, its numbers constantly fluctuate.

That the plant should have any trouble at all maintaining its numbers



A saguaro's ponderous cycle continues as a honeybee pollinates a fresh blossom. The resulting fruit may produce hundreds of seeds, but most will be eaten by predators.

seems incredible, considering that a mature saguaro produces at least 100 fruits a year, with some 2,000 seeds in each of them. Over the course of a century, it can produce more than 20 million seeds. If only one of them germinates and grows, the plant will have replaced itself. Yet at times, the odds against even that occurring are astronomical.

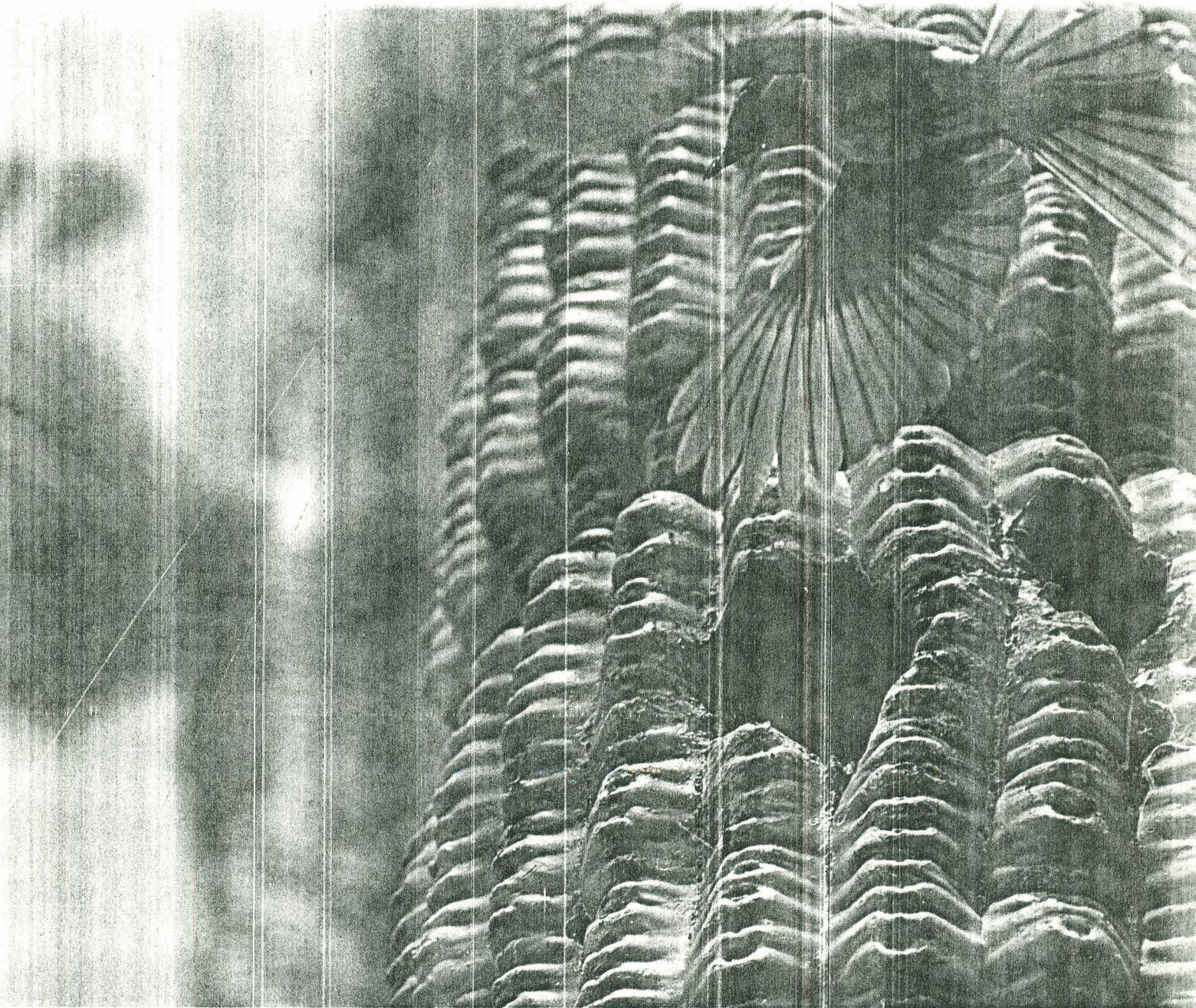
Not long ago, two University of Arizona researchers set up a number of test sites in Saguaro National Monument to study seed loss. In one plot, harvester ants began removing the seeds three minutes after they hit the

ground. In another, ants carried away every one of the 1,000 test seeds in little more than an hour. Those seeds that were not eaten by insects, birds or rodents were often blown into areas unsuitable for germination.

For any seed that does survive, growth is ponderously slow. Researcher Warren Steenbergh found that less than one percent of all seedlings live through their first year of life. Those that do survive grow to less than a half-inch during that time. They do not reach a foot in height until their fifteenth year, and by their fortieth year, they are still less than ten feet tall. Throughout this "juvenile" period, the struggle for survival continues. In one test plot, Steenbergh watched as a single cutworm larva moved in for the

kill. "In just 72 hours," he recalls, "the creature had consumed all the fleshy, aboveground portions of 28 saguaro seedlings and parts of 6 others."

With so many natural enemies, it is surprising that the saguaro is still abundant in many areas. But while it has predators, the plant also has some loyal friends: the nurse bushes that "care" for the tiny seedlings. The first European visitors to the Sonoran Desert noted that almost every young saguaro was growing beneath a paloverde or mesquite tree. What was then shrugged off as coincidence is now recognized as a partnership that greatly benefits the saguaro. For it is these nurse plants that protect the small cacti from the harsh sun, the cold and sometimes from animals. Without these trees, few sa-



guaro seedlings would survive. And without the giant cacti, a number of desert birds would be hard-pressed to find nesting sites.

Unlike the nurse bushes, people have not been good friends to the giant cacti. In some areas, cattle grazing has taken a particularly heavy toll on saguaro seedlings. In other places, cactus rustling has become a booming, million-dollar-a-year business, fueled by the recent interest in using cacti for landscaping. (See "Please Don't Pick the Butterworts," NW, April-May 1976.) With mature saguaros bringing as much as \$1,000 in some western cities, the plants have become favorite targets of the nearly two dozen large-scale poaching operations currently working in Arizona.

"Last year, at least 4,000 saguaros were taken illegally off public lands in the state," says Richard Countryman, who heads an Arizona task force formed to corral cactus rustlers. Not long ago, Countryman apprehended one man who had taken some 500 saguaros out of the Sonoran Desert. Despite such pressures, however, Countryman is optimistic. "The species will survive," he says.

That opinion is shared by many knowledgeable Arizonians. "Ever since the turn of the century," observes Raymond Turner, a scientist with the U.S. Department of the Interior in Tucson, "people have heard how hard it is for the saguaro to establish itself, and they have taken that to mean it is in serious trouble. My own feeling is that, while

This Wied's crested flycatcher is just one of several desert opportunists that will take over an abandoned woodpecker nesting hole in a saguaro. During the summer, the temperature inside the cactus' thick pulp may be 30 degrees lower than that outside.

Ripe with fruit, a saguaro's spiny arms spread like tentacles over the Sonoran landscape. The plant's expandable skin can double its girth during the rainy season, enabling the cactus to soak up as much as 200 gallons of water during a single storm.

it has definitely vanished in some areas of the desert, the saguaro will be here long after we're gone." That conclusion seems fitting for a plant that the Indians believed was created by a divine bead of sweat.

Writer Barbara Bigham lives in Tucson near the heart of Arizona's saguaro cactus country.