

Mountaineers have noted that as they climb, for example, up to the 12,633-foot Humphreys Peak in the San Francisco Peaks in Arizona, plant life changes radically.

Starting among the cacti of the Sonoran Desert, one climbs into a pine forest at 7,000 feet and a treeless alpine tundra at the summit.

It may seem that plants at a given altitude are associated in what can be called “communities” – groupings of interacting species.

The idea is that over time, plants that require particular climate and soil conditions come to live in the same places, and hence are frequently to be found together.

Scientists who study the history of plant life are known as paleobotanists, or paleobots for short.

They build up a picture of how groups of plants have responded to climate changes and how ecosystems develop.

But are these associations, which are real in the present, permanent? A great natural experiment took place on this planet between 25,000 and 10,000 years ago, when small changes in the earth’s orbit and axis of rotation caused great sheets of ice to spread from the poles.

These glaciers covered much of North America and Europe to depths of up to two miles, and then, as the climate warmed, they retreated.

During this retreat, they left behind newly uncovered land for living things to colonize, and as those living things moved in they laid down a record we can read now.

As the ice retreated and plants started to grow near a lake, they would release pollen.

Some would fall into the lake, sink to the bottom, and be incorporated into the sediment.

By drilling into the lake bottom it is possible to read the record of successive plant life around the lake.

The fossil record seems clear; there is little or no evidence that entire groups of plants moved north together.

Things that lived together in the past don't live together now, and things that live together now didn't live together in the past.

Each individual organism moved at its own pace.

The fossil record seems to be telling us that we should be thinking about preserving species by giving them room to maneuver – to respond to environmental changes.