AIR QUALITY STUDIES AT CAPULIN MOUNTAIN

During your visit to Capulin Mountain National Monument you may see a ranger operating some unfamiliar equipment. We are part of a network of 20 National Park Service areas, mostly in the West but a few in the East, doing a national study of air quality.

It seems self-evident that many human activities are putting little particles into the air. Industrial smokestacks, automobile exhausts, strip mining, coal-fired generating plants, even the dust of a cattle drive all pretty certainly affect air quality. Visibility may be reduced, breathing affected, and recently we have been realizing the dangers of certain particles combining with water to form "acid rain," which can contaminate surface waters and affect life in vast areas. There is no doubt that changes are occurring. But when it comes to making laws to prevent further air damage, or starting expensive clean-up projects, the nation needs hard data, accurate information. It is not enough for an old-timer to say, "Why when I was a boy I could see every tree on that ridge, and now they're just a blur!" Quite likely he's right; but just how much damage is that? And is it constant, or occasional? And just what is the material in the air? That is the kind of information this study is designed to gather. We wish, of course, that we had these data from decades ago. But from now on we will be able to make accurate, measurable comparisons.

The basic instrument for this research is a multiwavelength contrast telephotometer. The "contrast telephotometer" part refers to the fact that this instrument measures the light reflecting off of a target (usually trees 15 miles or so away) and, by comparing that light to the brightness of the open sky, measures any loss of visibility due to material suspended in the air. In addition the instrument is "multiwavelength." It measures not only light in general, but also in specific wavelengths. Air-borne particles of different sizes reflect different wavelengths, or colors, of light. For instance, oxides of nitrogen make the sky shift toward the red-brown, while oxides of sulfur shift it toward a milky color. The instrument detects this, which helps determine just what the pollutants are, which helps us figure out where they are coming from.

Another instrument used here takes direct samples of particles in the air. Vacuum cleaner type motors pull air through different kinds of filter paper. Then the papers are chemically analyzed to determine exactly what was in the air.

This project is beginning to give us accurate information where before we had only estimations. In some places the data confirm what we already suspected. In other cases we are being surprized, sometimes that the facts show that the air quality is better than we hoped — but other times worse than we feared. In either case, this long term research will supply information our nation needs to make intelligent decisions about protecting and developing our resources.