



Witch doctors, wizards, and Greek Philosophers left a legacy of lore

The Mythology of Meteorology

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(Left) 1. Hopi Indians performing a snake dance to bring rain.
2. Ra, the Egyptian sun god. 3. Thor, the Norse god of thunder.
4. Two Chinese weather gods riding a cloud herald the approach of a thunderstorm. 5. Zeus, Greek god of the elements.

Worrying about the weather is one of man's oldest pre-occupations. He has always tried to understand it, to influence it, and —most of all —to predict it.

Modern meteorology, the science of weather, was born only a few hundred years ago. Until the invention of the thermometer and the barometer, accurate measurement of the basic elements of weather was impossible.

For thousands and thousands of years, superstition, pseudo-science, and imagination were the principal wellsprings of weather 'knowledge,' generating a cumulative mythology of meteorology, the prehistory of our modern science.

The witch doctor of some neolithic clan may well have been the first weather wizard to rely on ritual and incantation to bring rain or still the storm. Indeed, in our own Southwest today, rain dancers continue to beseech ancient gods, even as airplanes overhead seed clouds with silver iodide.

Clay tablets in the British Museum tell us that the ancient Babylonians associated weather with the positions and motions of heavenly bodies. The priestly profession of astro-meteorology they developed, however, was more interested in "omens" than meteorological forecasts, as illustrated by the ancient adage of Asaridu, a Babylonian priest: "When it thunders in the day of the moon's disappearance, the crops will prosper and the market will be steady."

The early Greeks, in their turn, related weather (and all natural phenomena) to their gods. The rainbow was the many-armed robe of Iris; earthquakes were caused by the restless movement of Typhon in his underground prison; and lightning was a manifestation of the anger of Zeus, father of the gods, whose sign was the thunderbolt. In many lands, there was even a special stone or statue worshipped for its magical power over weather.

About 750 B.C., the Greek poet Hesiod, ignoring the gods, published some weather rules based on observation, and they were sound. The Greeks began making regular weather observations about the fifth century before Christ. During the same century, Hippocrates, the father of medicine, wrote of the effects of climate on human health and comfort. A little later Aristophanes, in his play, "clouds," questioned where Zeus really made it thunder, or whether the noise was caused by clouds "banging together."

It was a Greek philosopher and astronomer, Anaximander of Ionia, who gave us the first recorded scientific definition of wind: "a flowing of air," a definition still difficult to improve.

Some 200 years later, probably between 347 and 335 B.C., Aristotle published *Meteorologica*, a monumental milestone in the history of weather science. In *Meteorologica*, Aristotle collected most of the previous writings on astronomy and meteorology and attempted to explain all natural phenomena. He included the work of Hippocrates, Democritus, Anaxagoras, Anaximenes, and Empedocles, espousing one grand, relatively simple theory embracing all—shooting stars, the aurora borealis, comets, haloes, rainbows, the Milky Way, rain, clouds, mist, dew, frost, snow, hail, winds, rivers, seas, thunder, lightning, earthquakes, typhoons, fire-winds, and thunderbolts. Since his work was based on the then-accepted theory that everything in the universe is composed of only four basic elements (earth, air, fire, and water.) Aristotle was eventually proved wrong in most of his conclusions; yet

Meteorologica was the "weather bible" of men of science for almost 2,000 years.

Even in Aristotle's Greece, the man in the street wasn't much interested in scientific explanations of the weather; he just wanted to know if it was going to rain the next day. To satisfy this popular demand, Tyrantus, a disciple of Aristotle, writing under the pen name of Theophrastus, published the *Book of Signs*, a long collection of rules for weather forecasting based on a mixture of "science" and folklore.

About 270 B.C. another Greek, the poet Aratus, wove these rules into popular verse and proverbs, many of which survive to our own day. A familiar example is the following verse form of one of Theophrastus' rules:

"Red sky in the morning

Sailor take warning:

Red sky at night

Sailor's delight."

A slightly different version of this proverb was later used by Christ when the Pharisees and Sadducees asked for a sign from heaven:

"When it is evening you say, 'The weather will be fair, for the sky is red.' And in the morning you say, 'It will be stormy today, for the sky is red and lowering.' You know how to read the face of the sky, but cannot read the signs of the times." (St. Matthew, 16:2-3)

From the earliest days, farmers and sailors have been credited with the ability to predict the weather by watching the sky, and people have associated weather changes with their bodily aches and the behavior of birds and animals. This cumulative store of ancient observation and imagination, often colored by superstition, was the basis for Theophrastus' and Aratus' work. Since many short-term weather proverbs and signs are based on intelligent observation, they often have considerable validity—though usually only for the locale where they originated.

Little was added to the knowledge of weather by the Romans, who were noted for their "borrowing." They accepted Aristotle's idea and passed them on. Virgil, borrowing freely from Theophrastus' work, published some weather forecasting rules in his *Georgics*, establishing the tradition of including weather "signs" in handbooks or almanacs for farmers.

After the breakup of the Roman Empire and through the Dark Ages, weather "science"—indeed all fields of knowledge—generally remained stagnant or deteriorated. Despite this, feudal astrologers had the thankless, often fatal, job of forecasting the weather for military campaigns. If the forecast and the campaign ended in disaster, the astrologer's life might well be forfeit.

Meteorologica was rediscovered in the 12th century and quickly became the last word on weather science—a distinction it enjoyed until the age of instrumentation dawned in the 16th and 17th centuries. Aristotle's work and the folklore of the Greeks were adopted by the people of the late Middle Ages, who added some folklore of their own, based principally on pious imagination. From the mid-thirteenth century almost until modern times, it was considered wrong to question the causes of weather and evil to investigate its processes. Original thought in meteorology, as in most branches of science, was to be blocked for hundreds of years.