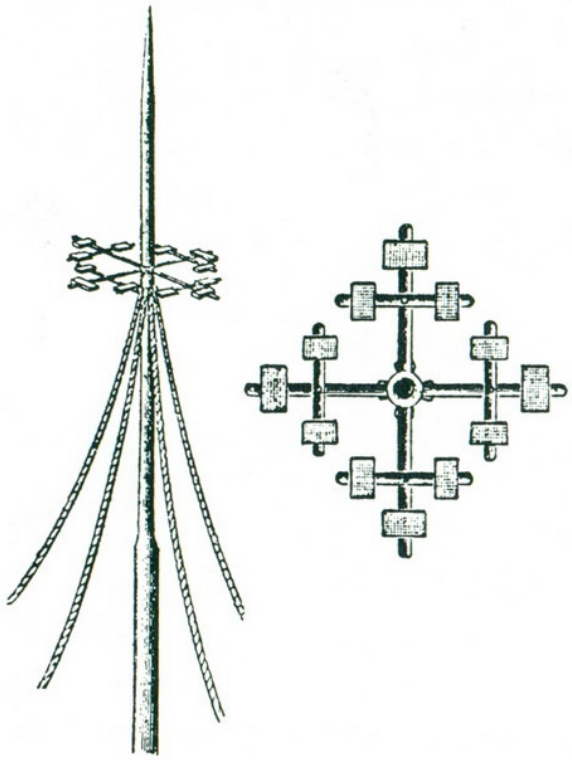
MYTHS & EXPERIMENTS

The "weather machine" of Prokop Divis had boxes of needles on all four branches, providing a multitude of points. It was mounted on a wooden shaft, but chains also connected it with the earth. (*Popular Science Monthly*, January 1893.)



(Text from Chapter 8, "Lightning Protection," "Technics and Architecture," Cecil D Elliot, 1993)

In ancient times it was believed that sleeping bodies were protected from lightning because in a relaxed state they offered no resistance to it, and obeying another myth at least one Roman emperor donned a wreath of laurel whenever a storm threatened.[1] On the whole, the most popular explanations of lightning and defenses against it were based on the assumption that it was divinely instigated and directed. It became a custom to ring church bells in order to dissipate the force of lightning, but there remained a theological embarrassment in the frequency with which the tall towers of churches were struck and demolished by bolts of lightning.

Peasant practices regarding protection from lightning often related to the bonfires built in some parts of Europe for the midsummer celebration of the Eve of St. John. Brands from the bonfire, when taken home and carefully stored in a cupboard, were believed in one district to protect the house from "lightning, conflagration, and certain maladies and spells."[2] In other locales, defense against lightning was provided by children throwing garlands of flowers on the cottage roof or by a householder's hanging on a wall a bunch of mountain arnica, an herb to which medicinal qualities were also attributed. A surer protection in some areas was said to lie in the fact that lightning would never strike a house in which a crossbill finch was kept in a cage.[3]

Churches and army powder magazines seem particularly to have focused public and official attention on the use of lightning rods. These subjects were combined when in 1767 lightning struck a church in Venice where city authorities had stored 100 tons of gunpowder in vaults they assumed to be protected by divine authority. A large area surrounding the church was razed and many were killed in the explosion.[4] There were bitter arguments between faith and science, but during the lifetime of Benjamin Franklin lightning rods were mounted on many of the major churches in Europe and in countries elsewhere.

No other name is so strongly associated with lightning protection as Franklin's. His interest in electrical experimentation began at a demonstration presented in Boston by Dr. Archibald Spencer, a Scotsman who started his career as a male midwife, ended as a preacher, and at a time between those occupations lectured on electricity. A year later Spencer played an engagement in Philadelphia and sold all of his demonstration equipment to Franklin. In the meantime one of Franklin's English friends

sent the Library Company of Philadelphia an "electric tube" in which could be stored the electrical charge produced by friction, along with pamphlets on European experiments with electricity and his own instructions. The gift was well-timed. At the end of 1748 Franklin retired from his printing business and had "no other tasks than such as I shall like to give myself and of enjoying what I look upon as a great happiness: leisure to read, study, make experiments, and converse at large."[5] Within six months of his retirement Franklin had conducted a sufficient number of experiments to write of them to Peter Collison and others of his many correspondents. The circle of Franklin's friends, the "Junto" organized in 1727 and later renamed the American Philosophical Society, provided both collaborators and an enthusiastic audience for demonstrations of the mysterious workings of electricity.

One of Franklin's early findings was that sharp-pointed conductors drew off electrical charges far more

of lightning over a relatively large area. In June of the following year this conductor was erected in a garden plot near Divis's rectory. Convinced that lightning was an electrical discharge and that metal points would attract it, he designed a lightning rod that bore a multitude of points (fig. 8.3). The central rod was supported by a wooden upright 48 feet high at first, and later said to have been increased to 132 feet, which was guyed with iron chains. At its top the iron rod bore two crossbars, each end of them having a smaller crossbar. In this way the rods provided 13 points, though blunt, but in addition each of the 12 horizontal points held a box filled with iron filings in which 27 brass needles stood erect. If one ignored the ends of the rods as points, there were altogether 324 brass needles to attract electrical charges.

For two years Divis experimented with his lightning rod. He proposed to his government the location of similar towers throughout the kingdom, but ranking scientists squelched the plan. The summer of 1756 was extremely dry in Moravia, and the farmers around Primetice blamed Divis's lightning rod with drawing off the moisture of clouds as well as their electrical charge. Anger grew and a throng of farmers tore down the tower.