We usually associate remote sensing with the post-Sputnik era, but efforts to understand Earth’s near-space environment began in the 19th century. This paper focuses on pre-satellite projects during the 20th century to probe the ionosphere and beyond, both by observing programs and the development of basic physics and theory. Observations of meteor tracks and spectra, cosmic rays, radiowave behavior, and ideas about dynamos and upper atmosphere electrical currents all played roles. These efforts culminated in successful researches of the 1950s and major investments during the IGY.