

Hale's first of four small popular accounts published between 1922 and 1931 containing in concise form all that made the frontiers of astronomy irresistible to the average American.

Hale, George Ellery. *The New Heavens*. New York: C. Scribner's Sons, 1922. 7 7/8 inches (200 mm), xv, 88 pp.

George Ellery Hale was the greatest astronomical entrepreneur of his day. His impeccable scientific credentials and ready access to the pockets of the wealthy enabled him to embark on many a grand or cooperative plan, in the humanities as well as the sciences. The role of the Emperor Rudolf II in the careers of Kepler and Tycho Brahe, or of King Jan Sobieski III in the life of Helvelius, was taken in Hale's enterprises by Carnegie, Rockefeller, the traction king Charles T. Yerkes, and the Los Angeles businessman John D. Hooker. But Hale himself was a major player: it helped that he had money of his own—Hale's father made a fortune building the hydraulic elevators without which no skyscraper was habitable. Hale inherited that engineering genius, and was humored by indulgent parents in his every scientific enterprise, devising a spectroheliograph at the age of 21 to enable solar phenomena to be photographed in broad daylight. But it was as a builder of observatories that he excelled.

Beginning modestly as a young man in the family backyard in Chicago with a 12-inch telescope—he called the building the Kenwood Observatory—Hale later founded the three greatest observatories of their day, first the Yerkes Observatory in Wisconsin (1897), and (in 1904) the Mount Wilson Solar Observatory (subsidized by Carnegie) above Pasadena, with its 60-inch reflecting telescope, then the largest in the world. It was here that Hale made his greatest discovery in astrophysics, finding evidence for the first time of the presence of magnetic fields in sunspots. His last great enterprise was not opened until 1948, after his death: it was the Palomar Observatory, with its 200-inch telescope, funded by Rockefeller money. Hale also reformed the National Academy of Sciences, obtained money for its grand Washington building, founded the National Research Council and what is still the leading organ in its field, the *Astrophysical Journal*, converted the semi-moribund Throop Polytechnic Institute in Pasadena into the

California Institute of Technology, and devised the basic plan for making the Huntington Library in San Marino into a research institution.

Hale's roughly 450 scientific books and articles give an excellent sense of his range of interests and specialist accomplishments, especially in solar physics and international scientific diplomacy, but to gain insight into his winning ways with the powerful and prosperous, one must turn to such books as *The New Heavens*, here reproduced, which contains in concise form all that made the frontiers of astronomy so irresistibly romantic to the average American. It was the first of four small popular accounts that Hale published between 1922 and 1931. An observatory was a sort of scientific factory: a businessman or financier could readily understand the problems involved. And telescopes were large and expensive instruments, ranked by number of inches: "The bigger the better" was a motto that both American industrialists and astrophysicists could endorse. The little book provided both audiences with *multum in parvo*.