TIME LIFE & MATTER

Science in Cambridge
Collection of Historical Scientific Instruments
Department of the History of Science
At the beginning of the twentieth century, a distinguished physicist explained how “all discoveries in optics provide hope of a discovery in astronomy.” The telescope had been one of such optical discoveries, giving birth to numerous other astronomical finds. The role of optics in astronomy increased as astronomers built bigger instruments. By the second half of the nineteenth century, telescopes had reached the gargantuan scale of the “Leviathan of Parsonstown,” 70 feet in length and carrying a six-foot diameter mirror.

By aiming it at nebulae, astronomers studied the age of the universe—its beginning and end. They brought astronomy to bear on evolutionary theory, thermodynamics, political economy, and, controversially, even on religion. In the nineteenth century, with the spectroscope, astronomers analyzed the chemical composition of the universe. Showing that the same fixed elements appeared in both sublunar and celestial spheres, their research had broad cosmological implications. With these optical devises, scientists shifted scales from macroscopic to microscopic domains. They moved from the present to the past and future.

Yet prismatic and lenticular optics were only a few of many other earthly disciplines that shed light on the astronomical nature of the universe. Mathematics, physics, chemistry, natural history, geology, meteorology, and even physiology played similarly important roles. Even outside of the domain of pure science, practices of navigation and exploration affected astronomy as much as commerce. Numerous other technologies and practices, such as model building, drawing, telegraphy, photography, slide projections, and cinematography, forever changed its face. Institutes of metrology standardized both astronomical units (such as the earth-sun distance) and mundane measures of length, weight, time and electricity. Reaction-time experiments became as central to astronomy as to physiology and experimental psychology. Even anonymous observatory employees, such as computers (initially mostly men) and scanners (initially mostly women), marked astronomical practices and affected scientific work environments beyond observatories. By looking at science through the lens of earthly instruments and instrumental practices, the astronomical universe appears less unified and more diverse; less of a universe and more of a multiverse.