Chapter 5

Science after Tyndall

The Growth of University Laboratories

In 1887 John Tyndall retired from his post as superintendent of the Royal Institution on account of his ill health. Insomnia, headaches, dyspepsia, and general fatigue combined to weaken him beyond the capacity of sustained research. Though he continued to experiment after retiring, his days of significant original research were over, and after six more years of continued decline, Tyndall died on December 4, 1893, from an accidental overdose of chloral administered by his devoted wife Louisa. Realizing that she had mistaken the chloral for magnesia, she said to him, “John, I have given you chloral,” and Tyndall, ever one to look facts in the face, replied, “Yes, my poor darling, you have killed your John.” Louisa was devastated by her fatal mistake; she spent the rest of her long life collecting materials for a definitive biography of Tyndall, which she did not live to see published, and battling the increasing obscurity surrounding Tyndall’s name.

Even by the time of his retirement, however, Tyndall’s prominence both in the scientific community and in the public eye was waning. A new generation of scientists began to overshadow Tyndall and his colleagues in the 1880s and 1890s. While controversy over the influence of science in culture had by no means diminished toward the end of the century, its focus had shifted; with scientists becoming accepted as influential public figures, the scientific community began to pay more attention to the credentials of men hoping to enter its ranks, which increasingly worked within the standardized and regulated realm of university-based science. This transition into professionalism,
however, was not clear-cut; the shift was gradual, varied, and amorphous, and scientists at the turn of the century remained a heterogeneous group, some using traditions dating back to Faraday and the beginning of the century, others looking ahead to innovations in theory as well as practice. Most combined old and new, the transition becoming visible only on a larger time-scale than can be seen in one generation.

This chapter explores the nature of this gradual transition by contrasting Tyndall with scientists prominent in the last decades of the century, in particular James Clerk Maxwell, one of the group of “North Briton” scientists who often ranged themselves against Tyndall, and the two men who succeeded Tyndall at the Royal Institution, the third Baron Rayleigh and J. J. Thomson. These three men held in succession the Professorship of Experimental Physics at the Cavendish Laboratory at Cambridge University, and the chapter argues that their allegiance to the laboratory, set up largely according to Maxwell’s vision of scientific research, acted as one of the main factors in distinguishing Rayleigh and Thomson from the older generation of scientists to which Tyndall belonged. The chapter examines the founding and development of the Cavendish as well as the scientists who established it as a center of teaching and research, and it discusses the wider changes in the attitude and methods of a science veering increasingly from physical demonstrations to mathematical theories.

These changes in scientific language and concepts, coming hand in hand with increasing specialization within scientific fields, in turn led to a shift in the audience for scientific lectures and information. The main audience for in-depth scientific research came to comprise students within the educational system, provided with years of training and exposure to the newer methods and theories. As this form of science became more standardized as a university-based field of study, it also became more inaccessible to the general public, a result that Tyndall had not anticipated in his vision of inculcating science into culture through the means of education. Public lectures such as those delivered at the Royal Institution, and popular books on science such as Tyndall had written with such great success, came to represent a different, simplified version of science, designed to acquaint the general public with vague scientific ideas but unable to convey the complex sophistication of scientific research as it was being carried out in the new university laboratories. Whereas Tyndall had prided himself on explaining the intricacies of science with such clarity that anyone could understand him, his successors increasingly believed that their