

Foreword

Steven Weinberg

Few scientists and even fewer nonscientists will ever have read the original reports of classic scientific discoveries. For instance, in my life I have met only two physicists who have read Newton's *Principia* (and I am not one of them). And why should they? Science, unlike theology or the arts, is a cumulative enterprise. We now understand things much better than those who preceded us. Any competent graduate student in theoretical physics today understands the general theory of relativity better than Einstein did, so why should he or she read the 1915 papers in which Einstein struggled to understand gravitation, space, and time?

Still, it would be a pity to cut ourselves off completely from our past. The history of science is as interesting as any other branch of history, and for scientists one of the gratifications of our work is the sense of continuing a great historical tradition, of carrying forward the work of our predecessors and preparing the ground for our successors. Indeed, in learning science, we all absorb a certain amount of scientific history—Darwin and Wallace did this, and then Mendel did that, and so on. The trouble with this potted history is that it never captures the extreme difficulty of taking a new step, and it is often just plain wrong. For an understanding of the history of science, there is no substitute for actually reading some of the great works of past scientists. It is therefore cause for celebration that Laura Garwin and Tim Lincoln have assembled this collection of classic scientific papers from *Nature*, with explanatory essays to make the papers accessible to a general audience.

The collection is remarkable, not only for the importance of the individual articles, but also for the fact that they all appeared in the same

journal. It used to be assumed that natural philosophers (only later called “scientists”) would be able to read and understand reports of new discoveries in any area of science, and could often make contributions to many of them. Think of Charles-François de Cisternay Du Fay, who in the early eighteenth century wrote papers on geometry, fire pumps, artificial gems, phosphorescence, slaked lime, plants, and dew. Now we are terribly specialized, and can read papers only in our own sub-sub-sub-specialties. Aside from the proceedings of learned academies, there are only two English-language scientific journals that keep up the old tradition of encompassing all of science: *Science* in the U.S., and *Nature* in Britain. In this collection of articles from *Nature* one can read seminal articles in every field of twentieth-century science. Every field, that is, except my own: elementary particle theory. For some reason, particle physicists rarely submit their work to *Science* or *Nature*. (But *Nature* had its chance: Enrico Fermi submitted to *Nature* his great 1932 paper on the theory of beta decay, which founded the modern theory of weak interactions, but it was rejected.) Looking over this collection, I begin to feel that we should. We would be in such good company.

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