Preface

Analogies in science are used either to explain certain observed experimental facts or to predict new effects. An appreciable fraction, if not the majority, of important discoveries in modern physics is based on analogies, and one could take the point of view that the entire evolution of science is determined by this way of thinking, even if those who were involved were not always conscious of this.

Despite the importance of this fundamental fact, there is apparently no book in the scientific literature (at least in the physical sciences) dedicated to this subject. Moreover, to understand how and why at a certain moment a certain analogy was used one has to know the specific historical circumstances under which the new idea was developed. While a particular analogy itself may be explained in scientific journals or in textbooks, the historical background is usually not. These historical circumstances are of interest and often essential—for the undergraduate or graduate student who learns the subject for the first time, but also for the practitioner who looks for inspiration or who wants to understand what his colleagues in other fields did and why, and last but not least for the historian of science.

The present book is an attempt to contribute to filling this gap, albeit a quite subjective one: I tried to address this issue by referring to different phenomena in subatomic physics studied or predicted over the last decades and to which I contributed personally. Some of the predictions have been confirmed, others are still in the pipeline and quite a few might never be verified or even proven wrong. Still, I hope that even those in the last category might be useful, if not for

any other reason than to prevent somebody else from repeating these mistakes. Given the general readership to which this book addresses itself, I attempted to present the effects discussed at a level accessible to the non-specialist.

Although the notion of analogy originated in the exact sciences, and more precisely in mathematics (in Greek *ana logon*, means "according to a ratio" and referred initially to a *similarity* between two figures), it was soon extended to other domains of science, including history. This is reflected also in the content of this book when discussing the personal and historical background. Indeed, it is this background which almost by itself led to analogies in life as well: I had the "privilege" of living under two dictatorships, the Nazi and the Communist ones, and I was lucky enough to survive, while a large part of my family did not. This motivated me to try to draw parallels between the two regimes. Furthermore, in the second part of my life, I was fortunate to live in different democratic countries, most recently in Germany and France. This stimulated my attempt at comparing life in these two countries, again, of course, from quite a personal point of view.

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