Chapter 27

Ladislav Kvasz

What Can the Social Sciences Learn from the Process of Mathematization in the Natural Sciences

Abstract

The paper tries to put the conflict of the natural and the human sciences into its historical context. It describes the changes in classification of scientific disciplines that accompany a scientific revolution, and offers an alternative to Kuhn’s theory. Instead of a conflict between the proponents and opponents of the new paradigm it interprets the revolution as a conflict between the mixed disciplines and the metaphorical realm of the old paradigm.

27.1 Introduction

For almost two centuries there has been a tension between the natural and the social sciences. As Thomas S. Kuhn writes in The Structure of Scientific Revolutions, it was this tension that led him to the creation of the notion of a paradigm. According to Kuhn the difference between natural and social sciences consists in the fact that while in natural sciences we have to do with research in the framework of normal science based on a widely accepted paradigm, in social sciences there is nothing comparable to paradigms and so scholars again and again question the foundations of their disciplines. Kuhn thus drew attention to an important difference between these two areas. Nevertheless, according to Kuhn this difference does not create a gap between them:

I’m aware of no principle that bars the possibility that one or another part of some human science might find a paradigm capable of supporting normal, puzzle-solving research. … Very probably the transition I’m suggesting is already under way in some current specialties within the human sciences. My impression is that in parts of economics and psychology, the case might already be made.

If we want to understand this problem it is expedient to look at the tension between the natural and social sciences in a broader historical perspective.

The first thing which we probably notice after turning to a broader historical perspective is that the conflict between natural and social sciences is not as old as it might seem. In the Classical era there was no conflict between the way how people understood human and social phenomena on the one hand, and how they approached nature on the other. This, of course, does not mean that in the Classical era the whole knowledge would form a harmonic whole. Also in Greek science there was a conflict that in many respects resembles the tension between the natural and the social sciences that we encounter in modern times. The border, along which the tension manifested itself, nevertheless, ran elsewhere. It did not separate knowledge of nature from the knowledge of human and social phenomena but rather it separated the mathematical knowledge (based on the deductive method and using categories such as number, proportion, and shape) from the “organic” realm (based on causal explanation and using categories such as purpose, goal, and action). In this second realm we could find biological as well as social disciplines, i.e. disciplines which according our classification lie on the opposite sides of the barricade that separates the natural from the social sciences. Ancient Greeks approached in a similar way the study of the “generation of animals” and the study of “the psyche” or politics. Starting from the seventeenth century onwards the study of the “generation of animals” was gradually incorporated into the realm of the newly constituted natural science, while the study of “the psyche” became one of the crystallization cores of the emerging social sciences. Therefore, one of the first aims of the present paper is to propose a framework for the reconstruction of the shifts in the classification of scientific disciplines.

27.2 Classification of Scientific Disciplines According to Their Relation to the Paradigm

In order to be able to understand the transitions of scientific disciplines between the categories of “hard” and “soft” sciences it is useful to form a more differentiated image of the “topography of the scientific landscape” that lies between these two poles. As a first move we suggest to abandon the terminology of dividing the scientific disciplines into “hard” and “soft”. Instead let us call the “hard” disciplines paradigmatic disciplines. In contemporary science the paradigm is formed by physics and so the paradigmatic disciplines are all those disciplines in which the methods of quantification and measurement lead to success. For a more precise characterization of a particular area of “soft” disciplines I suggest to introduce the term elusive region of the paradigm. It comprises those disciplines where the methods and approaches of the particular paradigm cannot be employed. Besides these two kinds of scientific disciplines we introduce two other kinds which lie