

# DIFFERENTIATION OF SCIENTIFIC DISCIPLINES: CAUSES AND CONSEQUENCES

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## Summary

The scientific discipline as the primary unit of internal differentiation of science is an invention of nineteenth-century society. There exists a long semantic prehistory of *disciplina* as a term for the ordering of knowledge for purposes of instruction in schools and universities. But, only the nineteenth century establishes real disciplinary *communication systems*. They are based on specialization of scientists, on role differentiation in the organizations of science, the emergence of standard forms of scientific publication and the rise of the research imperative which demands an incessant search for novelties. All these structural changes coalesce to the disciplinary community as a new type of communication system in science. After having been established, the discipline functions as the unit of structure formation in the social system of science; in systems of higher education, as subject domain for teaching and learning in schools; and finally as designation of occupational and professional roles. Although processes of differentiation of science have been going on ever since, the scientific discipline as a basic unit of structure formation is stabilized by these plural roles in different functional contexts of modern society. Finally, each individual discipline is embedded into an internal environment of other disciplines. The continuous mutual observation and interaction of these disciplines is the most important factor in the dynamics of modern science.

## 1. Introduction

The scientific discipline functions as the primary unit of internal differentiation in science. In this function, the scientific discipline is an invention of nineteenth-century society. There exists a long semantic prehistory of *disciplina* as a term for the ordering of knowledge for purposes of instruction in schools and universities. But only in the

nineteenth century did academics establish real disciplinary *communication systems*. After that, the discipline functions as the unit of internal differentiation in the social system of science, in systems of higher education, as subject domain for teaching and learning in schools, as designation of occupational and professional roles and as *address* for knowledge demands from other functional contexts in society. Although processes of differentiation of science are going on all the time, the scientific discipline as a basic unit of structure formation in science is stabilized by these plural roles in different functional contexts of modern society.

## **2. Unit Divisions of Knowledge: Classificatory and Archival Functions of Disciplines**

*Disciplina* is derived from the Latin *discere* (learning), and it has been used since late antiquity and the early Middle Ages as one side of the distinction *disciplina* vs. *doctrina*. Both terms meant ways of ordering knowledge for purposes of teaching and learning. Often they were used synonymously. In other usages, *doctrina* is more intellectual and *disciplina* more pedagogical, more focused on methods of inculcating knowledge. A slightly later development among the church fathers adds to *disciplina* implications such as admonition, correction, even punishment for mistakes. This concurs with recent interpretations of discipline, especially in the wake of Michel Foucault, making use of the ambiguity of *discipline* as a term always pointing to knowledge and to disciplinary power at the same time. A last relevant context is the role differentiation of teaching and learning and the distinction *doctrina/disciplina* was obviously correlated with it, *doctrina* being prevalent on the side of the teacher, *disciplina* being more necessary on the side of the pupil.

One can still identify the same understandings of *doctrina* and *disciplina* in the literature of the eighteenth century. But what had changed since the Renaissance is that these two terms no longer referred to very small particles of knowledge. They pointed much more frequently to entire systems of knowledge. This went along with the ever more extensive use by early modern Europe of classifications of knowledge and encyclopedic compilations of knowledge in which disciplines functioned as unit divisions of knowledge. The historical background to this was the growth of knowledge related to societal developments such as the invention of printing, the intensified contacts of Europe to other world regions, economic and population growth, and their correlates such as mining and building activities, exploring previously unknown strata of Earth. But, in these early modern developments, there still dominated the *archival function of disciplines*. The discipline was a place where one deposited knowledge after having found it out, but it was not an active system for the production of knowledge.

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**Rudolf Stichweh**, b. 1951; studies of sociology and philosophy in Berlin and Bielefeld; Dr. rer. soc. 1983 at University of Bielefeld; 1985-9 Max-Planck-Institut fuer Gesellschaftsforschung, Koeln; 1987 Maison des Sciences de l’Homme, Paris; 1989-94 Max-Planck-Institut fuer europaeische Rechtsgeschichte, Frankfurt a.M.; 1994-2003 professor for sociological theory, University of Bielefeld; 2000 guest professor at École des Hautes Études en Sciences Sociales, Paris; 2001 guest professor at University of Vienna; 2003- professor for sociological theory, University of Lucerne; 2005-06 fellow at Wissenschaftskolleg zu Berlin.

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