

Disciplines, Interdisciplinarity,  
Transdisciplinarity:  
Structures of Differentiation in Modern Science

td-conference 2011, Berne

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# Scientific discipline as primary unit of differentiation in science

*Three levels of the realization of disciplines:*

Cognitive level: Self-reproducing population of concepts, theories and methods

Social level: Community of specialists

Communicative level: Population of publications referring via citations to earlier publications

# Societal function of disciplines

Guarantee of stable addresses for communication processes in science and/or knowledge demands directed towards science

Systems in which disciplinary addresses are processed:

- Science
- Higher education
- Primary and secondary schools
- Occupational and professional roles
- Articulation of knowledge demands by other function systems

# Semantic background to «disciplines»

Late antiquity

disciplina - discere

doctrina - docere

Church fathers

admonition, correction, punishment for mistakes

Renaissance

coupling of «system» and «discipline» - but still  
archival function of «disciplines»

M. Foucault

«discipline» as a way of disciplining oneself and  
others

# Modern scientific disciplines (1750 – 1870)

Genesis of the scientific discipline as a real social system in science, as a system of the production of science, as a system of the dissemination of science

Which are the preconditions?

- Specialization vs. encyclopedic interests
- Role differentiation in educational organizations
- Communities of specialists
- New forms of publications
- Communities around publication outlets
- Search for novelties
- Research as the institutionalization of search for novelties
- Disciplinary careers
- Professionalization of scientific disciplines

# Modern system of disciplinarity and interdisciplinarity (1870 – 2011)

1. Internal environment of other scientific disciplines («milieu interne»)
2. Expansionary strategies of disciplines trying to encroach on the domain of other disciplines
3. Incessant proliferation of ever new disciplines / subdisciplines (> 10.000)  
three parallel processes (in evolutionary terms)
  - novelties – via interdisciplinary combinations
  - selection – adaptation
  - isolation, separation, closure – speciation
4. Globality of the scientific discipline (global small world)
5. Collaboration structures arising – as the structural form of interdisciplinarity (coauthorship)
  - building interdisciplinarity into the individual scientific paper
6. Global expectations of excellence drive interdisciplinarity

Inter- or Trans-

Test of the strength of an elementary unit

Internationality vs. transnationality

Interdisciplinarity vs. transdisciplinarity