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## **Interdisciplinarity, History and Cultural Encounters**

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**Abstract:** Interdisciplinarity has entered the agenda of researchers, teachers and policy makers and will remain there in the future. This does not mean that interdisciplinarity is understood the same way let alone is appreciated everywhere. Researchers are challenged by increasingly complex problems in culture, nature and society beyond disciplinary boundaries; higher education has to cater a volatile job market where known disciplines no longer define their own niches in terms of topics or practices for their candidates; and decision makers are confronted with challenges that do not respect ideologies of political parties and reports based on mainstream knowledge. In this context, interdisciplinarity is an ongoing re-consideration of the creation, the communication and the application of knowledge uniting the perspective of research, teaching and decision making. While most discussions on interdisciplinarity focus on its theoretical and methodological complexity in an exclusively contemporary perspective, this article will discuss interdisciplinarity in a historical perspective as central to European history of knowledge as well as in an intercultural perspective.

**Key words:** interdisciplinarity, Aristotle, the French Encyclopedia, history, intercultural relations.

## **A Contested Notion**

Interdisciplinarity is a topic that invites passionate discussions in academic as well as political circles. Bringing it up among academics will, in all likelihood, release two reactions. There will be one of jubilation: Yes, this is where the future of science lies in view of the grand challenges humankind is confronted with today and in the future. Or, alternatively, we will meet outbursts of skepticism, if not outright enmity: No, this is the death of disciplines, their identity, the core of their knowledge and practices and will only lead to superficial and half-digested science.

In a political context interdisciplinarity will provoke similar but also more ambiguous reactions: Yes, we have to invest in interdisciplinary frontline research which can give us a better understanding of problems no single disciplines can handle. Yet, on the other hand, politicians also want to maintain the differentiation of disciplines as the backbone of discipline specific programs of higher education and of the organizational structure of research institutions. Otherwise the political arguments for planning, financing and defining the goals of research and higher education may slip through the fingers of politicians afraid of losing control over research institutions. Under those circumstances, interdisciplinarity only receives support as an add-on function but never as a core practice: supplementary and elective courses and programs, individual research experiments, special institutional experiments or particular grants.<sup>1</sup>

Two incentives have spurred the explicit interest in interdisciplinarity over the last 30-40 years. One comes from within. It is a reaction to narrow academic parochialism and lack of innovation inside self-sufficient disciplines devoted to business as usual. Here, the reaction has been shaped as a rethinking of the self-definition of a discipline, its theories, methods and practices, maybe with an eye to other disciplines. The other motivation for pursuing interdisciplinary studies has been generated by a push from the outside, often under the label of

grand challenges such as globalization, environment, cultural encounters, new technologies, migration, clashes of religious beliefs, climate change, and such like. If the inside stimulus emerged from a criticism of institutionalized traditions, the outside drive has been generated by the ungraspable reality of globalization in the broadest sense of the word.

The problem today is to a large extent that the grand challenges have entered the academic and political agenda from the outside and will not disappear, but also that corresponding institutional rethinking of structures and programs from the inside has not taken place, or, if it has, only rarely in sync with the challenges they are intended to confront. This lack of balance between the inside and the outside push also impedes the career path of the best and brightest of young researchers: They earn their honors in frontline research beyond disciplines and on the margins of institutional structures, perhaps while living as global nomads. Yet, at the same time, they have to apply for positions in a heavily discipline-oriented institutional environment. The young talents we need for the future are often the most vulnerable victims of this skewed situation.

To this predicament is added a cultural problem: Today interdisciplinarity has a transnational outreach which implies collaboration between people from different academic and everyday cultures, a problem which everyone knows who has taught exchange students from other languages and cultures or are engaged in large scale international projects in labs and research environments embedded in other value systems than their own. Should we attempt to leave out this cultural context from the learning process, for the sake of the alleged universal objectivity of academic learning, we would have to blind ourselves to the cultural differentiation among academics in a globalized world of research, also when they act as professionals. However, we have never been taught ourselves to deal with this cultural dimension when we first

developed our disciplinary specialization. We learned theories, methods and practices in an environment where all players tacitly accepted common standards for an alleged de-culturalized and de-gendered 'scientific' behavior. This formation has trained us to conceptualize interdisciplinarity as collaboration between disembodied disciplines and not between persons carrying out the disciplines. The result is that we tend to suppress the cultural dimension or to make it just accidental, hidden under the illusion that the moment we enter the doors of an institution of research and higher education, we are all working on precisely the same foundation defined solely by the requirements of our disciplines.

This illusion is both nourished by global rankings and bibliometric counting and enforced by the much used and debated triad of interdisciplinarity, multidisciplinary and transdisciplinarity which, important as it is, only concerns theories, methods and disciplinary structures. People have vanished out of the picture as efficiently as ghosts by daybreak. However, interdisciplinarity in a globalized culture is a topic that activates more than relations between disciplines and includes directly and not accidentally institutional specificities and other issues of a cultural nature which in real life exercise a profound influence on our interdisciplinary practices.

This range of complex problems constitutes for me a much more pressing issue for interdisciplinarity as a difficult collaborative endeavor than the often highlighted difference between the humanities and sciences, the so-called two cultures, famously, or infamously as you like, referred to by creative writer and chemist C.P. Snow in *The Two Cultures and the Scientific Revolution* (1959)<sup>2</sup>. Rethinking interdisciplinarity may be a way of getting beyond this reductive and misleading opposition. It is reductive because it only captures the institutional side of the problem, but neither the cultural and personal aspect nor the relation to phenomena like the grand

challenges. It is misleading because it just repeats an opposition suggested in the late 19<sup>th</sup> century Europe before sociology and psychology and other newer fields were accepted as research domains and when positivism was a dominant paradigm in the Sciences and in the Humanities. The opposition was suggested, first of all, by the German philosopher Wilhelm Dilthey in his *Einleitung in die Geisteswissenschaften* (1883)<sup>3</sup> which echoes Immanuel Kant's reflections from the late 18<sup>th</sup> century on what he called the 'battle of the faculties', *Die Streit der Fakultäten* (1798)<sup>4</sup>. The problem became crucial in those days when the modern branching out of disciplines began in the 18<sup>th</sup> century Europe and gained momentum during the 19<sup>th</sup> century.

Last but not least, Snow's simplifying dichotomy overlooks that, due to internal specialization, the differences within the Sciences as well as inside the Humanities at times appear to be more significant than the opposition between them. The distance between, on the one hand, macro-biologists, like entymologists or biologists with net and waders chasing rare frogs and their habitats and, on the other hand, their colleagues in the same faculty working in molecular biology or nano-biology is much greater than the distance between macro-biologists and sociologists, geographers and ethical philosophers, anthropologists and medical scientists. Also, researchers in mathematical economy (econometrics), sociology and law do not always have an easy time together; they live within the same faculty, but often look elsewhere to find somebody to team up with.

Today, interdisciplinarity and disciplinarity have to be discussed anew, only now in the context of globalization which has produced or made visible the challenges that require different practices and institutional structures forcing us simultaneously to redefine both disciplinarity and interdisciplinarity in view of their reciprocity. In this paper I will try to add necessary nuances to this debate by a twofold argument: the first and longest part will deal with the *historical*

argument for the entanglement of disciplinarity and interdisciplinarity, drawing on an inspiration from the history of science in a period well before the occurrence of the modern differentiation of disciplines with which most of us are brought up. The aim is to suggest an alternative to the now petrified humanities-science opposition. The second and shorter part concerns the *cultural* dimension. In an attempt to take into account interdisciplinarity as a culturally contextualized globalized enterprise, this part will touch upon the role of globalization, not just in view of the global challenges we share, although with local and regional differences, but also its importance for the encounter between different scientific cultures.

## **History**

We have to learn from history. This erroneous cliché often means that we can find useful answers in the past to today's questions presumably similar to those answered in the past. Instead, I'm concerned with the questions not the answers. From history, we may learn to reconsider, not to repeat, forgotten or suppressed questions and incomplete answers that require new approaches, such as the question of disciplines and their interrelations. Did our predecessors ask questions we have forgotten? And if yes, why did we forget them? And what does it mean to reconsider the questions now?

I will go back to the earliest systematic European take on disciplines and their relationship as it occurred in Aristotle's works from the 4<sup>th</sup> century BCE. In his *Nicomachean Ethics*<sup>5</sup> Aristotle lists five different dimensions of knowledge, or rather five cognitive approaches which he sees as active parts of the soul, *psyche*. They cover or address different regions of reality and, taken together, they work as an umbrella for all his books on different disciplines like astronomy, physics, logic, rhetoric, biology, psychology, poetics etc. Truth in those disciplines

presupposes the activation of all five dimensions in different mutual relations. You may wonder why he does so in a book on ethics. This is so because for him both knowledge acquisition and ethics are characterized by the establishment of criteria for distinguishing between what is right and wrong in different regions of reality, and therefore ethics and knowledge are cognitive processes of the same kind, *species*. For Aristotle, then, knowledge acquisition without the goal of promoting the common good has not been carried out in the right way, no matter the perfection of its theory and method.

The five dimensions are:

- Creative knowledge or *techne*: constructive skills learned in such a way that the results can be evaluated as right or wrong: this is a chair and not something else, and also a good chair; the other one is not.
- Practical knowledge or *phronesis*: skills enabling us to live in a society and to organize human actions in the right way for the community – this law or institution is right, this one wrong; this societal action is right, the other one is not.
- Theoretical knowledge or *episteme*: knowledge which has the status of being necessary knowledge because what is true and false according to a logical argument cannot be otherwise, even when the research process is repeated by others. Theoretical knowledge can be learned, taught and repeated and does not depend on the skills of the individual researcher.
- Intuition or *nous*: the intuitive grasp of fundamental truth about things, *ousia*, by immediate experience, an experience based axiom. The natural place of a stone is the earth because, as Aristotle says, even if it is thrown into the air 10.000 times, it will fall to the ground every time.<sup>6</sup> This classical topological conception of the natural order of

things each defined through the space they occupy in nature and by nature builds on this intuition as an accepted axiom until the Renaissance.

- Wisdom or *sophia*: the synthesis of theoretical knowledge and intuition, an acceptable argument for the intuitive view of the fundamentals, only to be grasped by the few wise persons, the real specialists we would say today, who can not only see but explain the necessity behind the intuition which may not be broadly understandable. This is, in a sense, the limit of human recognition as hinted at by Niels Bohr who, concerning quantum mechanics and the principle of complementarity, is said to have uttered repeatedly to his students: “If quantum physics does not make you dizzy, you have not understood anything.”

Each of Aristotle’s range of disciplines builds on combinations of all five dimensions but with a different emphasis in relation to different objects. This idea reveals a view of what a discipline is which is somewhat different from the modern one. Aristotle claims, “where objects differ in kind the part of the soul answering to each of the two [kinds] is different in kind, since it is in virtue of a certain likeness and kinship with their objects that they [the parts of the soul] have the knowledge they have.”<sup>7</sup> To put it in simpler terms: different objects require different approaches meaning that one science cannot be the ideal model of another. Hence, the methods and theories underpinning a discipline are not only defined by internal consistency or by an ideal scientific paradigm shared by all disciplines, but by the requirement imposed by the different objects themselves. Logical truth does not count without pragmatic truth, as it were.

For Aristotle it would be absurd to call, for example, natural sciences more scientific than other research domains. They are just different because of the particular part of reality they

study. But if such a part is not placed in relation to the totality of reality the discipline in question will not contribute to the production of relevant and comprehensive knowledge. In Aristotle's view, disciplinary isolationism not only reduces the complexity of knowledge but also overlooks its relation to ethics, both of which are necessary to keep in mind when knowledge shall serve humans.

What all sciences share in his view is not a paradigmatic model, but an endeavor, namely to distinguish between what is true and false with regard to their objects. Hence, all disciplines produce a limited knowledge and will need each other. What is regarded as more or less scientific is misleading as a distinction between sciences; it only relates to the competence with which scientific practices are performed in different domains. As a cognitive endeavor all sciences, and for Aristotle also ethics, are of the same kind, but different as practices.

Physics, poetics and politics, to take but three disciplines on which Aristotle wrote books, are scientific enterprises of the same kind: First, because they produce a distinction between right or wrong in an ethical perspective, when pursued in accordance with the right skills for their scientific practice, their *techne*; second, because they are all based on nature or natural laws: Physics on the laws of self-reproduction (among several of Aristotle's definitions of nature, *physis*), poetry on the natural human proclivity for imitation, *mimesis*, and politics or sociology on the natural urge of humans to reproduce themselves within the nucleus of the social institution of a family or rather a household, *oikos*. All three disciplines, and other disciplines as well, study the same natural order but different 'slices' of it and from different angles. This order is assumed (by intuitive knowledge, *nous*) to be stable and fixed and, when seen as an object of study, translatable into a limited number of interrelated disciplines as dealt with in the impressive series of Aristotle's treatises.

That's why all five cognitive dimensions are active in all disciplines; otherwise they would not be disciplines, just intellectual ping-pong. Furthermore, thinking means that the study of any particular object or dimension of reality is only a valid discipline if it works as a platform from which the totality of its object, nature, and the other disciplines can be perceived. Hence, all disciplines are necessary in themselves and, at the same time, they are overlapping and interconnected. Therefore, there is no fixed hierarchy between the cognitive dimensions or between the disciplines; their interconnection depends on the context of study defined by the object where no discipline can stand alone. Disciplinarity and interdisciplinarity are two sides of the same coin and there is no reason to make a sharp distinction between them or even to establish such categories. A discipline is not a quasi-autonomous entity and the theoretical knowledge, *episteme*, which on Aristotle's list comes closest to a modern sense of scientific scrutiny, is not automatically and always given the highest priority in research; it all depends on the object and its context. His disciplines and cognitive dimensions are conceived horizontally, not in a vertical order.

### **Learning from History**

Although we do not today subscribe to the intuitive assumption of the fixed and stable natural order, what is revealed here is that disciplines never emerge as single or unique phenomena, but as a cluster of interdependent units. They are born to be engaged in interdisciplinarity, not to fight it and thus defend an illusionary quasi-autonomy with their own objects, methods and theories. All objects are but aspects of a larger field of investigation.

Aristotle's reflection raises some questions of a topical relevance. When did we forget to ask how disciplines emerge and functions in large clusters, not as single units? When did we

forget that science and ethics are Siamese twins? When did we forget that disciplines are platforms from where to look at the world at large, not quasi-autonomous units? When did we forget that types of science or knowledge domains do not constitute a hierarchy subsumed under one standard model for scientific excellence, but are horizontally organized approaches to a shared reality, an intuition today forcefully reintroduced with the notion of the grand challenges.

Hard questions to answer, but the need to come up with answers, different from Aristotle's, has been produced by the confrontation with global challenges where human and thus culturally shaped interaction with nature and natural processes cannot be clearly separated, although the institutional and political reluctance to reconsider the disciplinary structures and practices in education and research in order to tackle the problems is prevailing.

Nevertheless, some answers may be suggested: During the European Enlightenment the idea developed that neither the foundation of the human life world nor of nature is a stable order, but is changeable or historical, although on different time scales ranging from the galaxies via geology to social structures and cultural traditions. This shift in axiomatic thinking first occurred in a significant way in geology, but later led to the theory of evolution in biology; it also happened in a social context where the meaning of the term 'revolution' gradually changed its Copernican meaning of an eternal circular movement and came to indicate radical historical and man-made changes in a linear perspective of progress.<sup>8</sup>

This complex insight in the fundamental historicity of reality on different levels and according to different time scales had profound implications for the development of modern disciplines as we know them today. First of all, time, change and history became the new fundamentals, not stable order. Second, the type of changes in the human life world, based on human action, gave rise to one type of independent study, Humanities and later Social Sciences,

launched among others by Giambattista Vico in his *La Scienza Nova* (1725).<sup>9</sup> Moreover, the new preoccupation with change over time also gave another dimension to the conception of natural laws in the sciences now transformed into laws of processes and change, launched among others by Georges Buffon in his huge *L'histoire naturelle* 1-36 (1749-1804), but summed up in his *Des époques de la Nature* (1788).<sup>10</sup> The 18<sup>th</sup> century laid the seeds to the opposition between the two cultures which today has been made irrelevant by the entanglement of human action and natural processes in, for example, climate change, nuclear energy, bacteria resistance to antibiotics etc. Already after the Lisbon Earthquake in 1755 one reaction was that nature produced the seismic choc, human stupidity the catastrophe, but both of the same magnitude and completely intertwined.<sup>11</sup>

Thirdly, and most importantly, it followed from the idea of the basic historicity of reality that a new relation imposed itself between disciplines and the human and natural reality they have as their shared object. If nature and human life both evolve within the framework of a fundamental historicity, the structure of disciplines will have to undergo continuous change as well. Yet, being a reaction to the registered changes, this structure will always be one step behind the processes they study. In contrast, Aristotle saw the structure of disciplines as being in a complete accordance and synchrony with the natural order and therefore as stable as this order itself.

But how do disciplines then renew themselves on historical conditions? They do so in two ways: One is the creation of new disciplines and institutions in an ongoing proliferation of more and more specialization and differentiation. This has been going on in Europe since around 1800. It happened most fundamentally with the parallel and simultaneous creation around 1810 of two new models for educational systems including research institutions. On the one hand,

there is the French model initiated by Napoleon and still at work in France with the promotion of applied sciences as the main driving force for research organization and prioritization via *les grandes écoles*. On the other hand, there is the German or Prussian model, partly based on Wilhelm von Humboldt's reforms with independent curiosity driven research as the basic motor in a mutual exchange with education, social impact and application.

In this perspective, new disciplines may initially have had shared or overlapping objects, but then gradually grew away from each other in a process of increasing specialization, each taking care, in its own way, of its own autonomous slice of reality by abandoning a holistic perspective. Instead of being platforms for different and partly identical views of the same reality from where they could all see each other, they became fortified academic ghettos, defending their dogmatic singularity, primarily bound to particular theories and methods targetting isolated fragments reality. Lagging behind the development of a changing reality and the ensuing needs for new knowledge, new dimensions of reality required still new disciplines. Even more recent endeavors that initially had interdisciplinary intentions and ambitions, like gender studies, media studies, nuclear medicine, cultural geography and others were either turned into disciplines in order to get a foothold in the institutions, or they became special institutions, additional elective courses or particular centers of excellence. But they did not define faculties or universities as did old disciplines like history or physics.

Yet, another way of developing disciplines also came into being in the 18<sup>th</sup> century. Already in the very early days of the emergence of modern monodisciplinary universities the insight that the new feature of interdisciplinarity must have an explicit and specific foundation. Aristotle's tacit assumption of a static natural order that made interdisciplinarity an integral and necessary part of disciplines did not suffice anymore. Now, interdisciplinarity began to require

an independent argument that made this approach a particular one, different from disciplinarity. This new insight manifested itself most powerfully in one of the most advanced and audacious intellectual experiments in modern Western history, the French Encyclopedia, published as *l'Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers* (1751-1772). The new knowledge corresponding to the new approach to reality based on the idea of its fundamental historicity had to be obtained in collaboration between disciplines and between people with different competence supplementing each other to get a grip of the whole picture. With no stable reference dogmatically given in advance to constitute a common denominator, a shared foundation of the disciplines would had to be defined explicitly and, not least, to be accepted collectively and turned into a working program. This foundation should at the same time structure the reality to be studied, the theories to be involved and the methods to be applied.

In the *Encyclopedia* this attempt was presented in the so-called “Figurative system of human knowledge” in the first and introductory volume from 1751, written by Jean d’Alembert.<sup>12</sup> The figurative system was a stemmatic taxonomy of disciplines offering the necessary and possible knowledge concerned with a world based on historicity, which now would also include technical sciences and sociology as part of the disciplines. If the order of nature, created by the gods, constituted the foundation of Aristotle’s scientific model, the *Encyclopedia* placed ‘Understanding’ or ‘Entendement’ as the rock bottom of the interdisciplinary project. Here, the reality to be mapped is not thought of as a creation; reality is what can be grasped by human cognition and therefore it had movable and dynamic boundaries according to the advancement of knowledge.

In this context society was seen as an independent human creation, not a mirror of a divine natural hierarchical order with the anointed monarch as God’s earthly representative, a

claim that opened for the early debates on modern democracy. Moreover, as God is beyond human understanding, theology had to be left out of the figurative system as an independent study. It became a sub-discipline of philosophy and the study of religion appears instead as the study of the history and function of religious institutions. Furthermore, natural sciences now included the study of their application in technology and the crafts by which humans intervened in the natural order, foreboding the early industrial age in Europe.

Beyond such new approaches to reality from a historical perspective, the more wide ranging insight was that interdisciplinarity is born together with the disciplinary structure it is part of, not after it, as the more contemporary notion would have it. If we cannot see a discipline as a reflection of this structure but only in isolation and from the inside, we have not understood our discipline properly. Yet, although similar to Aristotle's thinking, this view of interdisciplinarity requires that a specific foundation has to be made explicit for every project, primarily from the objects or problems to be addressed, not from the disciplines involved. Their job is to adapt and change themselves; they are institutional structures, not quasi-natural kinds.

Interdisciplinarity as a concerted effort re-emerges rather late in the 20<sup>th</sup> century as a response to the shortcomings of the institutionalized differentiation of disciplines when confronted with new challenges produced by the reality we live in. However, interdisciplinarity has mainly been defined as a separate and independent practice which one can chose to take up or not, but not as an integrated dimension of disciplinarity. Therefore, interdisciplinarity is mostly seen as a reaction to the limitations of the disciplines themselves, not as a pro-active response to the complexity of reality that has released the need for interdisciplinarity in the first place. Therefore, over the last 30-40 years we have first of all been preoccupied with questions of the compatibility of theories and methods using terms like transdisciplinarity,

multidisciplinarity and interdisciplinarity. However, the grand challenges have brought the insight home to us again that interdisciplinarity is first of all a response to the complexity of a changing reality. In spite of this insight, our take on interdisciplinarity is still mainly conceived as a battle between disciplines, not as a response to problems and a collaboration between people.

In this context, the necessity to make the interdisciplinary perspective explicit in acceptable and appealing ways will force to bring the people who practice the disciplines back into the picture as individuals anchored and influenced by various institutional and cultural contexts. They are often forgotten behind the claim that theories and methods belongs to the disciplines, not to its practitioners.

### **The Cultural Dimension**

If some find this long reflection extremely Eurocentric, they are right. But there is a reason beyond my Eurocentrism. Modern universities across the globe are today established as the result of two European expansions. First, there was the institutional expansion on the back of colonialism when schools and universities were established, mainly in the English and French colonies. During European colonialism new institutions of learning transformed local education around the world, ranging from primary schools to higher education and research, also in regions like the Arab countries, Persia, India and the Asian countries with a long tradition for formalized education and research and more or less centralized governance and legal systems. Second, there has been a broader Western expansion, mainly after WW2, spurred by the success of Western science and its foundational principles and their institutional translations in programs, structures

and projects, now with a strong American inspiration. This inspiration further develops on institutions shaped during the colonial expansion.

The general Western model and the institutional organization that supports it define today the common standard for the various ranking lists of universities. Otherwise they could not be compared. The Shanghai ranking was mainly set up for regional reasons to acquire recognition for non-Western universities building on the Western model, and the pressure for ranking results and bibliometric counting is still more pronounced here than in the West, where it is increasingly being questioned. *The San Francisco Declaration on Research Assessment* (2012) from The American Society for Cell Biology protesting against the senseless reliance on bibliometrics insists that in order to be evaluated research has to be read, not counted, no matter the aim of the evaluation.<sup>13</sup> This reaction comes from the West, not from the East where ranking and visible hierarchical authority has a stronger status and a longer tradition. Everybody who has discussed joint publications between colleagues from East and West know the discussion of the different importance attributed to the formal status of the venues of publications and the order of the authors in case of co-authorship.

On the other hand, which is often forgotten, some influence went the other way as well, first of all in the Humanities. Here, the foundational national paradigm for disciplines in language, history, art and literature could not promote a proper understanding of other continents and cultures with another organization and governance, a partial blindness bolstered by the often colonial status of these cultures. The study of such regions and their cultural practices and products was partly absorbed by anthropology and religious studies or appeared as fragmented aspects in the small departments of comparative studies: their languages in one discipline, their arts in another, their literature in yet another, etc. Such non-European studies were forced into an

institutionalized disciplinary structure derived from the social and political structure underpinning the European universities and societies and national self-understanding. Here, they were departmentalized under disciplinary labels which overlooked their particular totality which was not entirely compatible with the European national paradigm. Some non-Western cultural products fell completely outside all disciplinary fences, and they, and the peoples as well, were studied and exhibited in museums and on world's fairs as specimens of exotic objects and peoples, in line with a Renaissance *Wunderkammer*.

Nevertheless, new interdisciplinary disciplines in the Humanities, often called area studies, also saw the light in various places, like Oriental studies or American studies or Australian studies (the latter still competing with the English departments in the two former European colonies). Whatever their flaws such studies may show, in today's world of cultural encounters such institutional constructions are the future and are being further developed in many places. In spite of the post-colonial criticism of Orientalism and Africanism, this is a future model for institutional organization around complex objects beyond the reach of singular disciplines, in particular where the traditional national language departments are blindfolding themselves in a globalized cultural context.

However, area studies and similar units have a hard time competing with nationally defined departments and disciplines which still are the backbone of Humanities in the majority of national Western and Western style universities. The fatal lack of understanding of the cultures in non-European regions today is, among other things, a result of an institutional structure of disciplines at odds with the challenges and the cultural complexities they should have been set up to explore. We only have to mention migration, aftermath of wars in the middle-east, religious radicalism or international terrorism to see the catastrophic result of a misguided disciplinary

structure for the shortcoming of our fragmented knowledge of how to grasp today's global reality.

A lesser known inspiration brought back by the Europeans comes from the Chinese imperial examinations. They were centered around written individuals exams which were codified in the format of eight-legged essay and carried out in huge examination halls situated in a few central places around the huge empire with each student sitting at his – not her – own desk.<sup>14</sup> In European institutions another model was preferred until well into the 19<sup>th</sup> century and even longer, maybe in the shape of various renamed modifications of the oral medieval examinations: *quaestio*, *dissertatio* and *disputatio*. Here, the individual written exams on a set topic, taking place in large groups on given dates during the year, was a late 19<sup>th</sup> century/early 20<sup>th</sup> century solution to the problems of adequate exams that corresponded to an increasing number of disconnected disciplines and, closer to our own time, also to a growing cohort of students. Ironically, this innovation in the West spread around 1905 when the traditional imperial examinations were abandoned due to its development into a petrifyingly complicated sophistication.

The European medieval oral forms are now almost only maintained in the doctoral viva but practiced in the greater part of the world. This type of *disputatio* can only be staged in the viva because, ideally, a doctoral thesis does not correspond to the general ideal of monodisciplinarity that developed throughout the 19<sup>th</sup> century. It rather reflects the Aristotelean ideal of the entanglement of disciplinarity and interdisciplinarity, although also this academic genre has shown an ever growing specialization in the second half of the 20<sup>th</sup> century. In principle and according to tradition, a *doctor* should not be a specialist in one field without being able to relate to a host of others. The famous 16<sup>th</sup> century astronomer Tycho Brahe was a

classicist, a poet, a medical doctor, an astrologist, a technological inventor etc., simply because he studied nature as a whole. And he was no exception but a proto-typical representative for the period. The three classical European forms of oral exams, *quaestio*, *dissertatio* and *disputatio*, tested the capacity of the candidate to have a grasp of the study of reality from whatever angle it might be. Instead, the written exam on a set discipline specific topic could never intended to document this capacity, and also corresponds to a lack of understanding of its relevance, produced by the proliferation and institutionalization of single disciplines.

Today and in view of the grand challenges, interdisciplinarity not only allows for but actually requires collaboration between researchers practicing disciplines in various ways and on various conditions across the globe. This situation opens two alternative takes on research practice and research organization: one is to subsume all universities under one homogenous structure which can establish one linear ranking order with a common denominator, and leave out those institutions which do not fit. Unfortunately, this is the development that the ranking lists support.

Another option is to work with institutions on their local conditions with an integrated knowledge of both cultural difference and ideal international scientific requirements. If a student or researcher wants to study African languages, he or she may go to the elite universities in South Africa, USA or similar places after having consulted various ranking lists and the programs offered. The student would get precisely the same education as one would get anywhere else in the world on the basis of the same universally read and discussed books and articles. Alternatively, one could choose to go to a place outside the ranking lists functioning on quite different conditions but situated where the language in question is spoken and studied. Here, the student or researcher would get a different approach to linguistic learning and later also

to publishing in venues flying under the Thomas Reuter radar. This would be essential for the practice and meta-discussion of precisely that language, as for instance Ibo, Gikuyu and Ndebele. To take another example: If one wants to study malaria, the road is open to research institutions with a great international reputation. Alternatively, one could go to more humble research units where the relevant data are collected and studied in the relevant social and cultural context. Or yet another example: If one takes on the task of promoting a medication or a technology by explaining their usefulness for a good life, the attempt will be a blatant fiasco without sufficient knowledge of the local culture, no matter the unquestionable efficiency of the pills and the device. If one does not know what health, medicine, a good life and the use of tools mean in that culture, nobody would be convinced to change their habits even when introduced to the most reliable scientific facts. The fight against HIV, crippling results of female genital mutilation and child mortality in Africa is a clear example that changes require that knowledge of medicine, sociology, language, religion and other disciplines be produced in a closely entangled interdisciplinary and intercultural collaboration.

In most cases today, researchers will have to combine contacts with prominent international universities and grant agencies with their relation to local institutions across the world of a lesser formal standing. And they will have to take into account that high level interdisciplinarity in view of the grand challenges cannot be carried without an integrated knowledge of culture and science and without a collaboration with people in institutions and contexts of a much more culturally diverse nature than any ranking list can imagine.

Those of us who have had the privilege of working in longer periods of time at international universities far away from our home ground, know that the moment the door to the lab or the seminar room is closed and science alone matters, the local culture is not left behind

outside the door. Different value systems that define generational hierarchies, gender relations, sense of honor and shame, norms of criticism and peer review, individual responsibility, transparency or lack of transparency in recruitment etc., continue to be part of the scientific collaboration and has to be regarded as an integral part of the working process and as something to be learned together with theories and methodologies. This learning does not aim at creating a homogenous global research environment ready to be ranked in order to please university managers and politicians. Instead it sets out to teach people to work with differences that define the necessary conditions for the global interdisciplinary collaboration without which the great challenges cannot be responded to. We need a global research community, but not a homogenous one. Researchers with only a detached yet maybe a high level disciplinary knowledge within a single university model will not be of great help in that process.

This is what I myself have taught my own students from freshmen to post-graduates and what I push young researchers to face. As researchers and educators it is our job from day one to promote an offensive approach with a broad perspective and contextual awareness to the discipline we belong to. For me interdisciplinarity is exactly about that.

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