

Two Cultures into One?

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Over the last few decades, two developments have brought fundamental changes to the study of the humanities. The digital revolution triggered the construction of huge databases, universally accessible and searchable on an unprecedented scale. As a consequence, new ways of thinking in wider contexts and organizing research on a larger scale came within reach of disciplines that had previously mostly been active on an individual level and focusing on particular phenomena. Moreover, applications of new scientific methods led to breakthroughs in fundamental humanities issues such as environmental and biological data that were essential for living conditions and for the formation of collective identities. The increased collaboration between disciplines led to major innovations.

Every major problem that we face in the world today, whether technological or not, requires contextual decision-making informed by humanistic study. [...] The solution to nearly every grand challenge resides more in the understanding of values and behavioural actions of humans than on a singular focus on technology. [...] While there is no argument that new technologies will help limit environmental pollution, I am not convinced that is the real solution. I believe the solution to the environmental crisis lies elsewhere – in behavioural changes informed by humanistic arguments about geographical and societal equity, values and choices.¹

The author of these bold statements is not a philosopher or any other scholar in the humanities, but the distinguished professor of psychiatry and behavioural science, and chancellor of UCLA, Gene Block. Informed by his scientific domain as well as by academic policymaking, he points to the patent lack of consideration for essential human values and ecological concern when major players in our world, multinational enterprises and governments, take decisions that have implications for humanity as a whole. His argument supports the one made a few years earlier by Martha Nussbaum, who criticized the unilateral focus of present-day societies on overall economic growth, even at the price of increased geographical and social inequality. To become responsible democratic citizens, people need to be educated to independent thinking, open-mindedness, empathy and imagination, qualities that are typically fostered by the arts and literature.² In times of rapid change, a ‘fragile ego protects itself against insecurity’ by seeking comfort in a peer group and subservience to authority.

That group is then presented as superior to stigmatized out-groups, an antagonism that occurs at all levels, from male behaviour towards women, to supporters of an opposing sports team, other nations and ethnic groups (Ref. 2, pp. 33-41).

About one century after the generalization of universal suffrage in Western Europe and North America, there are reasons for concern about the citizens' political education. This became strikingly apparent in the non-participation of nearly half of the eligible voters in the presidential elections in the US in 2016 (as in 1996), and the worrying level of the political debate in the UK about the Brexit referendum and its effects, also in 2016. Neither the freedom of the press, the unparalleled high standard of living, nor the unprecedented dissemination of all kinds of media, enhanced the quality of democratic decision-making or the citizens' satisfaction. The hopes liberals and socialists fostered for almost two centuries for a better world through broader political participation did not materialize. This distressing observation, to which data from other European countries might be added, may be connected, as does Martha Nussbaum, with the lack of recognition of the contribution the humanities and social sciences should have to civic society. Is this solely to be attributed to the spirit of capitalistic materialism that seems to steer the contemporary world, or can humanists do a better job in making themselves more valuable to their society? It seems all too easy indeed to blame businessmen and technocrats for their disdain for the 'soft' disciplines; they might be urged to engage more directly in public debate on matters they are studying, such as values, emotions, social change and human interaction.

The celebrated physicist Lord Snow delivered in 1959 the Rede Lectures in which he specifically condemned the British educational system as having, since the Victorian period, over-rewarded the humanities (especially Latin and Greek) at the expense of scientific education. He believed that, in practice, this deprived British elites (in politics, administration, and industry) of adequate preparation for managing the modern scientific world. By contrast, Snow said, better scientific teaching in German and American schools enabled those countries' rulers to compete more effectively in a scientific age. Later discussion of his famous *The Two Cultures* tended to obscure Snow's initial focus on differences between British systems (of both schooling and social class) and those of competing countries, but his distinction between the clusters of disciplines became classic.³ It seems, however, that nowadays, at least as far as research funding is concerned, the two sides of the balance have been inverted. The issue to be discussed here is, however, a different one. Rather than opposing two mutually exclusive and impermeable cultures, it seems more productive to look for opportunities to valorize the contribution different disciplines can make in addressing complex problems.

Endeavours towards 'transdisciplinarity' in higher education, urging undergraduate students to take courses in domains other than their major, did not produce convincing results. The main reason for this may well be that the methodological and conceptual differentiation between disciplines requires a more advanced level of preparation than can be expected from the large majority of the school-leavers. Broadly interested and highly talented students take two or more degrees, which allows them to fully grasp the logic typical for each discipline. Interdisciplinary research projects also meet difficulties as they have to be assessed by several panels of

specialists who tend to be dissatisfied with the share awarded to their own discipline. Nevertheless, the relativity of disciplinary domains is generally recognized: they have a function in a particular stage of the scientific development, but new challenges may require different approaches. The European Research Council initially planned to encourage interdisciplinary research, for which a generous share of the budget was foreseen. However, this ambition was soon given up by the lack of qualified proposals and, probably also because of the difficulty to design an adequate evaluation mechanism.⁴ Individual researchers still need in the first place to qualify within a particular discipline before they will be recognized beyond the established boundaries. The level of specialization rather requires the collaborative effort of researchers tackling a common problem from various angles and by different methods. Institutes for Advanced Study offer opportunities for the exploration of uncommon collaborations, which may lead to projects on a larger scale and a longer term.⁵

Such collaborations are far more common in the bio-medical, natural and engineering sciences than in the humanities and social sciences, which is easy to understand given the former's considerably larger scale of organization, both at the level of local units or labs, and on the global level. The object of their studies is global indeed, in contrast to the specificity of cultural and societal themes. As a consequence, articles published in the 'sciences' are relevant across the whole world, and are mainly written in English by collectives of authors, in highly specialized, formalized and technical terminology. The worldwide dissemination of research results triggers intensive interaction, exchange, mobility and competition. The demonstrated or alleged and indirect utility of the research outcomes for the economy or public health provides these disciplines with a dominant voice in all kinds of decision-making processes. Consequently, investments in human and material resources have grown rapidly. On the flip side, this application-oriented research strategy implies an ever narrower specialization, and a growing alienation from the general public.

Research on societal and cultural realities is organized in relatively small, if not individual units, mostly applying a limited infrastructure and dealing with data with a highly specific character. A great deal of the traditional humanistic research describes particular features and tries to understand them with methods focusing primarily on decoding. The objects of research are human acts and products functioning in a societal context in which relevant factors can hardly be reduced to be studied in isolation. Societal systems function in a natural and cultural environment that, over time, became more complex and difficult to disentangle as the scale grows. The multiplicity of interacting factors and the fluidity of the units under observation make comparisons shaky and generalizations hazardous. Inspiring models or descriptions of particular social patterns, which could be transferred to other societies, have been studies about patronage, brokerage and consociationalism. The first were initially considered as typical phenomena of non-western or partially modernized societies, but gradually became seen as widespread patterns of bilateral relations between partners of an unequal social status.⁶ Consociationalism and pillarization were first revealed as a typical feature of Dutch society and its polity, but were subsequently identified as patterns in other countries as well.⁷

Some phenomena have been described and compared in a number of cases, which brought some authors to observe recurrences or regularities. The number of cases under examination remained limited, while there is no agreement yet about the relevant factors, in order to exclude falsification through a divergent case. Classic studies on social and political revolutions may illustrate this point. They met an obvious demand from authorities to achieve insight into the conditions that might lead to threats to political regimes. Protagonists started by describing a handful of cases of major changes in the political system and class relations, and they identified common features. The next generation of researchers compared equally low numbers of successful movements with failed ones, in order to test the validity of the suggested causations. The extension of the number of cases in time and space led to the dismissal of general regularities, except for a few highly general and abstract observations about the discrepancy between the rulers' demands from their citizens and their achievements, the threatening of deeply rooted collective identities and established privileges, and the appearance of strong competitors.⁸ As a consequence, the ambition of an individual researcher to define the conditions for far-reaching social and political upheavals lost its attraction as a research theme because the number of variables had been shown to be too high to allow one to demonstrate general causal relations between them.

In other domains, successive waves focus on a particular aspect, such as institutions, emotions or agency, without leading to comprehensive analytical models. As a discipline dealing with less factual data than history, literary studies has to be more interpretative and, as a consequence, it is characterized by a great number of paradigms about which no consensus can be established. Case studies and interpretations are piled up without a systematic search for the necessary and sufficient observations to underpin coherent explanatory models. The lack of generalizations defies the formulation of laws or universals.

The great challenge would be to restrain from broad overviews, but instead dramatically increase the number of cases in a precisely circumscribed field of research, to take into account a well-defined number of variables, and analyse them through a standardized methodology. Such attempts are particularly promising for problems with a limited number of quantified variables. The Global Collaboratory on the History of Labour Relations may be quoted as a model for such a large-scale programme. Thanks to participants in a great number of countries, its first main goal

is to provide statistical insights into the global distribution of all types of labour relations in five historical cross-sections: 1500, 1650, 1800, 1900, [Africa: 1950], and 2000. The second main goal will be the explanation of signalled shifts in labour relations worldwide.⁹

It is obvious that the results of this research will have an impact on disciplines other than history alone.

However, some essential features of societal processes cannot be expressed in an objective scale, such as the role of emotions in mass movements or even in the attitudes and behaviour of leaders. The analysis of large scale collective societal processes

can be compared with meteorology. Huge mobile and fluid systems interact under the impulses of numerous variables; regularities and laws have been established but the predictability of the specific outcome of all the variables on any particular place and time retains a margin of uncertainty. The precision and reliability of weather forecasts has improved dramatically over the last decades thanks to observations from satellites and more encompassing databases processed by ever more sophisticated computer programs. Similarly, larger scale research programmes comparing greater numbers of cases through as many quantifiable variables as possible, might improve the generalization of social phenomena such as migration, consumer and voting behaviour, collective traumatization, social cohesion, protest or submission. As quantification will not apply to all the relevant variables, some of them will have to be classified in categories and left open to a level of uncertainty, just as in meteorology.

Some fields of the humanities and social sciences have a universal scope and/or need to apply techniques developed in the 'sciences' for the observation, analysis and interpretation of their data. Cognitive psychology and archaeology developed close collaborations with disciplines in the bio-medical, engineering and science domain respectively. Starting as a supporting service for the collection, identification and analysis of data, the interactions led to increasingly interwoven common research strategies with innovative potential for all the participants. For example, the preservation conditions of metals over centuries can be informative for the development of new techniques for the protection of materials against pollution. The converse effects are just as evident: chemical analysis of paint and dendrochronological dating and establishing the origin of wooden panels finished a lot of guessing about the authenticity and dating of art works and the artist's identity. The identification of the provenance of raw materials in archaeological sites proves the existence and the nature of overseas commercial relations over millennia.¹⁰ Psychological and sociological research is gradually seen as relevant for the non-invasive treatment of medical problems with a behavioural component, such as obesity and Aids prevention. Brain science is a very promising field emerging between the psychology of perception and learning, and the study of brain activity. New techniques make previously poorly understood phenomena, such as sensitivity to particular observations, taste and talent, visible as the activation of functions in particular brain segments. Pedagogues working on language acquisition or artistic expression receive boosts from their exchange with colleagues in medical departments. The term 'medical humanities' describes these new interactions, and other boundaries between 'the two cultures' are being reconfigured as well.¹¹

The IT revolution greatly affected the humanities and social sciences, especially because of the tremendous increase in the volume of data that can be collected from any place in the world and analysed at high speed. Sources such as artefacts that became scattered through diverse collections can now at a glance be searched, combined, and compared. Problems that had been known mainly through narratives and archaeological findings can now be unravelled on a large scale and with objective proof. Sensitive issues, such as ethnicity and belief systems, the geographic origins

and dispersal patterns of human and animal populations, have now been determined thanks to the reconstruction of ancient genomes and their comparison with modern references.¹² The formation of ethnic groups as a result of large migrations during the early middle ages has often been interpreted with an ideological bias. It has now been reconstructed as a complex pattern of concentric groups of different types of followers who were attracted by successful leaders of a core group whose cultural habits gradually became assimilated by the others. Chemical analysis of skeletons learns more about the diverse origins of groups that finally settled somewhere, about their nutritional patterns, health conditions, beliefs, interrelations and life style.

In the last decade, scientific research has focused on fluctuations of climatic conditions in different regions of the globe over long periods of time. Massive amounts of data have been produced, based on the analysis of the presence of pollen, the growth rhythm of various species of trees, and the composition of ice layers. Temperatures and humidity can now be determined with high precision over the centuries in large parts of the world. Historians learned over the last few years that exceptionally harsh climatic conditions, prevailing during the fourteenth century in the northern hemisphere, caused the great famine from 1315–1317 and several other years of extremely poor harvests all over the continent. These circumstances then triggered a bovine epizootic, the origins of which must have been the combination of biological factors with trading activity that facilitated the rapid spread from Central Europe to England. Bovine mortality on English demesnes in the 1320s and 1330s was over 60%. The devastating effects lasted until around 1340, and only then did herds again attain the size they had before 1315.¹³ The European population that was hit by the Black Death in the late 1340s, had suffered already from a combination of very serious hardships over 30 years.

The most striking discovery came in 2010, when an interdisciplinary team undisputedly identified traces of *Yersinia pestis* in ancient DNA material of Black Death victims buried in several medieval cemeteries. In later publications, they detected the genome's differentiation in branches, spreading from northwestern China westward among the overland trading routes.¹⁴ Alexandre Yersin, the epidemiologist who discovered the bacterium that caused a plague epidemic in China from 1894–1897, claimed that he had discovered the pathogen behind the medieval pandemics of the sixth and fourteenth centuries, but until recently no epidemiological proof existed for that. His intuition is now proved to have been right. Biomedical research is at the basis of a fundamental breakthrough in medieval history. However, the plague's extremely rapid spread over the continent depended on human factors such as regular long-distance trade, high levels of urbanization, and intensified warfare.¹⁵

So the origins of the medieval world's most dramatic mortality crisis were established by a team of evolutionary biologists and epidemiologists implementing genomics, lab experiments and statistical/mathematical modelling to understand pathology, transmission and evolution of *Yersinia pestis* and how these dynamics are affected by climate. The pathogen had survived for centuries as an enzootic among sylvatic rodents in semi-arid central Asian steppes. Abruptly increasing humidity in the

1340s led to a transfer of the infection either directly to humans or via commensal rats. Human mobility further disseminated the plague to China and during the following centuries it was exported from Europe to other continents where it underwent mutations.

A comparable breakthrough is occurring in environmental history. Changes in the vegetation and fauna, and of the interaction between humans and the natural environment, came into the picture. The climatic change of our days can now be compared with previous occurrences, some of which developed more abruptly than the present one. Natural hazards such as volcanic eruptions and floods had dramatic effects on human societies, while lasting processes such as deforestation, erosion and desertification have begun to be studied by environmental researchers into the past as well as those primarily dealing with the present.

All these examples show that humanities and social sciences are collaborating ever more closely with various specialists from the 'other culture'. This implies the adoption of similar research questions and methods. Most of all, all the researchers in those fields are challenged to think out of their traditional boxes, and to cross boundaries. Key phenomena of the human past have become better known and explained, especially in the fields of the interaction between humans and the natural environment, the effects of domestication and consumption of animals, migrations and the formation of communities, ethnic, cultural and religious identities. On the other hand, one would like to see more interaction, including arts, humanities and social sciences in the designing and implementation of scientific and technical projects. Steve Jobs studied calligraphy, which he applied ten years later: 'we designed it all into the Mac'. Such a transfer is the privilege of a genius, but inspiration by the other half of our brain, in which reside creativity, innovation, emotion and empathy, would surely improve the long-term efficiency of applications and the quality of our lives.

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