Studies in Universal Logic

Julie Brumberg-Chaumont
Claude Rosental
Editors

Logical Skills

Social-Historical Perspectives

Birkhäuser

Studies in Universal Logic

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Preface

The volume wishes to address a variety of questions arising when logic is approached by overriding compartmentalization, by adopting an interdisciplinary viewpoint, and by taking into account its fully social and historical dimensions. By raising the question of logical skills, it aims at pausing and stepping aside from an approach essentially centered on the doctrinal history of logical theories.

Logic has long been seen as a natural and universal human ability, as much as a series of skills that only "sane," "educated," and "civilized" men can master. The volume investigates this tension. It explores how various logical skills have been established as social norms and attributed, or denied, to some actors or groups in different spaces throughout history. Written by historians, philosophers, and sociologists, and drawing on several case studies, it examines how these skills were defined, taken as standards and identified in some individuals, while they were deemed missing in others. It studies how they have been mobilized in educational theories, practices, and policies. It examines the dynamics of valuation (i.e., assessment and valorization) and implementation of these skills across different epochs, ranging from the Middle Ages until the present day. It specifies the different conceptions of logic underpinning these approaches, as well as their social and political stakes.

The representations of logic related to the different cases studied in the book are quite diverse. Some of them refer to Aristotelian and syllogistic conceptions. Others refer to a "natural logic" rooted in the human mind or to artificial languages. Others still involve non-classical logics as opposed to a unitary and universal logic, or logics allegedly proper to some peoples (i.e., "native logics"), as opposed to "Western logic."

The social political issues raised by the identification and possible enhancement of logical skills in some individuals rather than others are manifold. The book shows that it has helped to support distinctions between "primitive" and "civilized" peoples, between "uneducated" men and the "elites," or between "normal" and "disabled" individuals. It has led to define principles and norms for the functioning of the human mind, whether for infants, for children as they develop, or for adults. Symmetrically, this approach has led to identify deranged, illogical people, as well as idiots.

These distinctions have been used to assign varying rights and duties to different human groups or to their members. They have upheld principles and methods for selecting individuals in educational institutions and dynamics of exclusion of groups considered socially or racially inferior because of their "logical disability" or their "pre-logical mentality." They have been instrumental in justifying colonial domination, as much as convicting and executing criminals.

This volume differs from many psychology publications in that it does not seek to highlight the acquisition, possession, or lack of logical skills in anonymous and interchangeable "subjects" according to a reference logic. It deals with socio-historically situated actors and groups and analyzes the conceptions of logic that are mobilized to valuate their skills and to devise educational "politics of logic."

The volume is also different from various philosophical works that offer a reflection on the (il)logical ways of thinking and acting of societies—or of the individuals who compose them. On the contrary, such reflections are taken as an object of social historical study in its own right.

Furthermore, it differs from histories of ideas in the field of logic. It does not set out from a definition of logic that would serve as a once-and-for-all fixed reference, which would lead to select some approaches to logic and exclude others from the scope of our study. It develops a social historical approach to logic. By focusing on logical skills, it shows the many ways in which logic can be understood. Logic does not simply appear as a set of theories and doctrines, but also as a tool that individuals and groups use for numerous purposes in various institutional, political, and social contexts. Generally speaking, logic is seen as a social practice.

This volume is intended for researchers, teachers, and students in several fields of knowledge, including history, sociology, and philosophy of science, as well as logic, psychology, and colonial studies. We hope that the theoretical reflections and case studies it contains will inspire our readers and elicit new approaches of logic based on an interdisciplinary and non-reductionist perspective.

Aubervilliers, France — Julie Brumberg-Chaumont
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Introduction. Logical Skills: Social-Historical Perspectives

Julie Brumberg-Chaumont and Claude Rosental

Abstract Logic has long been seen as a natural and universal human ability, as much as a series of skills that only "sane," "educated," and "civilized" men can master. The volume investigates this tension. It explores how various logical skills have been established as social norms and have been attributed, or denied, to some actors or groups in different spaces throughout history. Written by historians, philosophers, and sociologists, and drawing on several case studies, it examines how these skills were defined, taken as standards and identified in some individuals, while they were deemed missing in others. It studies how they have been mobilized in educational theories, practices, and policies. It examines the dynamics of valuation (i.e. assessment and valorization) and implementation of these skills across different epochs, ranging from the Middle Ages until the present day. It specifies the different conceptions of logic underpinning these approaches, as well as their social and political stakes. This introduction presents the approach adopted by the editors of the volume. Such approach is based on the view that anthropology, sociology, and history share a common project. The editors explain how they wish to promote a historical sociology and anthropology of logic while addressing the issue of logical skills. The contributions to the volume are summarized in the last section of this introduction.

Keywords Social norms · Valuation · Primitives · Race · Inequality · Disability · Rationality · Insanity · Idiocy · Child development · Education · Anthropology · Sociology

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The studies presented in this volume tackle a variety of issues pertaining to logic. These questions arise when logic is approached by overriding compartmentalization, by adopting an interdisciplinary viewpoint, and when it is understood in its fully social and historical dimensions. By raising the question of logical skills, we aimed at pausing and stepping aside from an approach essentially centered on the doctrinal history of logical theories.

The volume inscribes itself in the long history, exploring questions ranging from the Middle Ages to the contemporary period. It is partly the fruit of exchanges that took place between 2016 and 2018 in the framework of three workshops held in France and Italy.[1] The papers that we have gathered around the notion of logical skill have been authored by philosophers, sociologists, and historians, especially of anthropology, working in Europe and America.

We would like to begin by outlining the main results that emerge from this volume, before we specify the approaches to logic adopted and introduce the contributions collated here.

1.1 Exploring the Social and Political Issues Raised by Logic Throughout History

This book highlights various social and political dynamics connected to varying representations and uses of logic over the course of history. Some of these dynamics have been investigated by means of various methods and are at the heart of this volume. Others have been partially addressed in the literature. Others still, we do hope, will be the subject of future studies.

The ability or inability to master logical operations has been abundantly designated as a criterion for evaluating individuals and human groups, selecting them, and defining hierarchies between them. The possession or lack of logical skills has been used as benchmark to place individuals and human groups on various scales of values, to legitimize social stratifications, and to stabilize different political orders. This reference has contributed to assigning varying rights and duties to humans, distinguishing between individuals who may or may not testify or be convicted in court, such as children, lunatics, as well as those suffering from various types of "mental disorders" (Metzler, this volume). While all human beings, once they had passed the stage of early childhood, were supposed to be endowed with a "natural

[1] "Homo Logicus I. Logic at the Edges of Humanity." Florence (Italy): European University Institute, org. J. Brumberg-Chaumont and A. Romano (EHESS, Paris), with S. Van Damme (EUI, Florence). https://www.eui.eu/events/detail?eventid=121251, accessed 6/25/2020; "Homo Logicus II. The Infancy of Logic, Native Logics." Paris (France): EHESS, org. J. Brumberg-Chaumont and A. Romano, with S. Van Damme and A. de Libera (Collège de France, Paris). https://www.ehess.fr/fr/colloque/homo-logicus-ii, accessed 6/25/2020; "Homo Logicus III. Sociology and Anthropology of Logic: Past and Present." Vichy (France): UNILOG, org. J. Brumberg-Chaumont and C. Rosental. https://www.uni-log.org/start6.html, accessed 6/25/2020.

logic," according to a terminology that emerged during the Middle Ages [1, 2], some individuals were described as "disabled," "primitives," "savages," or belonging to "inferior races," and designated as definitely deprived of this natural logic, or, as the famous formula goes, as displaying a "pre-logical" mentality [3].

The artifactual enhancement of this natural potential, i.e. the ability to grasp an "artificial logic," has been perceived in many socio-historical spaces as a privilege of more or less limited, educated, or "civilized" groups (Blanckaert, Brumberg-Chaumont, Goodey, Metzler, this volume). This process, aimed at achieving an essential part of our human capacities, i.e. our rationality, led to the establishment of policies of logical education. The legitimacy of the very process has sometimes been criticized, as early as in the Middle Ages (Poirel, this volume) and the Renaissance, in favor of humanistic logics [4], and, again, in the twentieth century, especially in the context of a feminist and emancipatory critique of the logical straitjacket inherited from Aristotle [5]. This critique has also given rise to new theoretical constructions of logic, in order to better capture the naturalness of logic, starting with the constitution of a Hegelian dialectic that aimed at better theorizing the "life" of "the logic" and of "logic" [6]. The latter approach can be compared to that of the theorists of "natural logic" in the twentieth century [7]. These new constructions were also instrumental in accounting for the "logic of others," based on the plurality of contemporary logics (see [8, 9]; Rosental, this volume, regarding the logic of the Zande people).

From the nineteenth century onward, the idea of a stable pattern of natural evolution that would include the animal kingdom along with human societies and the mental functioning of individuals, an idea that has been referred to as "intelligence" (Blanckaert, this volume), came also to be understood through the notion of "natural logic" by some anthropologists (Pratt, this volume). This anthropological device offered a new form of legitimacy to the notion of logical skill, while opening the door to a possible social, historical, and anthropological diversification of logic, according to the various environments to which it must respond, with a coherence of its own (see, for the logic of Zande people, [10–12]; and Frega, Pratt, Rosental, this volume).

Within this framework, the "primitives" have not, in many cases, been judged irrational for the lack of possession of "our" logic from the twentieth century onward (Pratt, Rosental, this volume); they have even sometimes been placed on the same level as certain philosophers and "civilized" people (Frega, this volume). In the wake of the severe critique of the notion of "pre-logical" mentality, reference to logic has been used less and less frequently, especially in twentieth century social sciences, to legitimize hierarchies among human populations. The reference to a pluralized logic has also provided tools to escape colonial ideologies, and to "decolonize" logic ([9]; Pratt, this volume). It should be noted, however, that despite the emergence, in the twentieth century, of a plurality of logics [13], of the inescapable notion of a logical pluralism—or even logical relativism [14]—the use of the concept of logic in the social sciences is more often than not poorly reflexive, based on a monolithic, sometimes outdated vision of what logic should be (Rosental, this volume).

Logical skills have thus served as a criterion to establish major divides at different times in history. These divides are not only located within humanity, through the distinctions made between various groups of human beings (e.g. male/female, educated/uneducated, civilized/primitive, adult/child, normal/mentally disabled, inferior/progressive races), but also in interspecific representations, especially based on considerations of the logical capacities of animals. They have led, for example, to the development of classifications between apes, "pygmies," simianized Black people, and "civilized" people, and between different types of animals and humans. They have thus led to varying conceptions of the unity of man and of the animal world (Blanckaert, Brumberg-Chaumont, Metzler, this volume), of inter-individual differences, and of the place of mankind in the order of nature (Goodey, this volume).

The elaboration of hierarchies and equivalences and of continuities and ruptures based on a reference to logic concerns many fields, beyond human and animal ontologies. As we have suggested, logic has also been instrumental in thinking about history. It has been used as a tool to identify civilizational stages related to the "human mind" or to the "progress" of humanity. It has led both to tracing historical continuities and discontinuities, and to more or less strong and justified dramatizations of the role of logic in the fate of societies. These dramatizations, like the values associated with logic, are not the prerogative of the past, as in the Middle Ages, when logic was first given a major educational role ([1]; Brumberg-Chaumont, this volume). We also find traces of these undertakings throughout the nineteenth and the twentieth centuries, most notably in the context of colonial policies aiming at the intellectual regimentation and acculturation of indigenous populations ([9]; Pratt, this volume), and in the enthusiastic adoption—connected to internal political and cultural strategies—of "Western logic" in China at the very beginning of the twentieth century [15]. We also find such traces when logic was perceived as a tool for maintaining civil peace and the peace between nations after the two World Wars. Indeed, logic was seen by then as a source of concord or as a bulwark against the development of ideologies that were deemed dangerous. We also find more recent traces in the debates on artificial intelligence that took place at the dawn of the twenty-first century [16].

Logic has also been invoked throughout history to think about the nature of the individuals and their perfection. This has been the case in the process of defining and measuring development from childhood to adulthood. The ability to master various logical operations has been mobilized as a benchmark to bring to light progressions, standstills, and even regressions in human development, as in the theories of some nineteenth-century French anthropologists-naturalists (Blanckaert, this volume). Such benchmark has been used to identify phases of development, underdevelopment, or antidevelopment, depending on the cases under consideration (e.g. "feral children," "normal" cases). These identifications have left their marks on history, as well as on the "prehistory" of modern psychology (Goodey, this volume). Logic has also been invoked to grasp regulated mental functions of individuals, to identify an internal discipline of the mind, and to highlight its possible disorders. This approach has led to define logical, illogical, or partially logical behaviors, based on diverse meanings given to the term "logic."

Logic has been invoked to think other boundaries. Some of them are related to reason and science, and are at the heart of moving dichotomies between certainty and uncertainty, between deductive and experimental sciences (Frega, this volume), as well as between logic as natural or as artificial (Brumberg-Chaumont, this volume). Logic has been variously referred to in order to define not only the contours but also the core of rationality (Rosental, this volume). The same applies to intelligence, normality, and madness, as well as to mental or communicational disabilities (Goodey, Metzler, this volume).

The studies of this volume highlight a wide range of representations of logic, as well as of its uses throughout history. These representations also relate to the very nature of logic. Depending on the case, logic appears more or less as a matter of language, of the functioning of the mind, of nature, of society, or of ideal or normative principles of reasoning and thought. It has been commonly understood through the prisms of differentiations between natural and artificial, indigenous and Western logic, and their variants. A significant aspect of this history has been the different disciplines with which it has been articulated. As a matter of fact, logic has been considered merely accessory in relation to other fields of knowledge, or as an autonomous discipline, or yet associated with grammar and rhetoric. It has been also seen as part of psychology or connected with anthropology. The significant integration into computer science departments of research in logic at the turn of the twenty-first century, and the conceptions of logic as instances of the functioning of technological devices, which have developed over the contemporary period, may lead to forget how important these various disciplinary connections have been for centuries [17].

The large range of approaches to logic, which affects its very definition, helps to explain some of the specificities of our own undertaking, as we would now like to point out.

1.2 Historical Sociology and Anthropology of Logic: The Logical Skills Issue

Our approach in this volume is based on the view that anthropology, sociology, and history share a common project [18, 19]. On the basis of this assumption, we wish to offer a renewed approach to studies on logic: a historical sociology and anthropology of logic addressing the issue of logical skills.

In order to grasp the variety of representations and uses of logic over the course of history, we have eluded adopting a definition of logic that would have served as a once-and-for-all fixed reference, which would have led us to select some approaches to logic and exclude others from the scope of our study. The same applies to the multiplicity of practices that can be associated with logical operations. We have not stated which associations were legitimate, nor have we ruled out any of those that the actors were making. Rather, using proven solutions to the general problem of social scientific description [20], we have analyzed how individuals, including human and social scientists, have identified logical reasoning and

behaviors in different socio-historical spaces, how they have perceived the nature of logic(s), and which debates their views have generated.

Adopting such a stance had already proven useful when developing a sociological approach to logic in the contemporary period [16]. Until recently, the actual modalities of knowledge production by researchers in logic had not been subjected to empirical investigations, contrary to the experimental sciences that have been studied through laboratory ethnographies conducted from the 1970s onward [21, 22]. Indeed, in the same manner as intellectual work in general, research in logic has long been considered an essentially solitary, immaterial activity, or an activity related to cerebral processes. As a result, sociological methods were deemed inoperative to observe and analyze it.

Since the end of the nineteenth century, however, various authors had engaged in theoretical discussions about the possibility of developing an anthropology or a sociology of logic (e.g. [10, 23, 24]). But these projects did not go beyond theoretical or programmatic stages. Moreover, they were not cumulative. In particular, the terms "sociology" and "anthropology" took on very different meanings, without generating any real debate. For instance, David Bloor aimed to show through various case studies how what is held to be logical in human societies is in fact subject to variations and evolutions, and determined by particular and changing institutional configurations. Developing Lakatos' critique [25] of "formalistic philosophy," Bloor [10] indeed suggested that formal reasoning was considered acceptable only when it appeared compatible with the institutional contexts in which it took place. Until the 1990s, the rare sociologically inspired works on "logical cases" were mainly based on text studies. Eric Livingston [26] had thus analyzed textual practices conveyed by the proof of one of Gödel's theorem. From an ethnomethodological viewpoint, he indeed considered that actors' competent practice constitutes the adequate metalanguage to describe their activity. Ethnographic research on various everyday activities of producers of logical statements and theories emerged at the end of the twentieth century [27]. They converged with comparable approaches to mathematics that soon followed [28]. Mathematicians' work had not been previously subjected to on-site observations either. These studies have contributed to exploring the multiple social dimensions of these activities, and, in particular, to documenting how the production of certified knowledge in logic could take place [16].

The fact that such undertakings did not take place until recently can be in particular explained by the fact that sociologists have long considered logic primarily as a methodological tool, that would warrant the coherence of analyses [19], or determine the validity or rationality of the reasoning or behaviors that were being observed [29]. These viewpoints were generally based on a spontaneous definition of logic as a formal and abstract discipline, following a restricted approach to logic that was established at the beginning of the twentieth century. They reflected stable representations of logic—in particular, conceptions centered on the ancient notion of syllogism, which contrasted strongly with the evolution of the objects of contemporary logical research.

Detailed empirical investigations have uncovered a variety of dynamic conceptions and of little-studied contemporary practices in the field of logic. In order to

make them intelligible to sociologists, it seemed useful to first clarify the a priori and stabilized views on logic particular to researchers in the humanities and the social sciences. This helped to draw comparisons and underline the reality of the conceptions and practices observed among logicians. Moreover, the diffuse nature of references to logic and the diversity of its uses within societies, as well as the need to grasp their extension and modes of articulation, has led us to go beyond investigations dedicated to scholarly productions and a disciplinary history of logic. In fact, the contributions to the volume clearly highlight important connections between the history of logic and the history of religions (i.e. by studying faith and election), the history of legal practices (i.e. around issues of liability and testimony), and the history of education. We can also mention the uses of logic in psychology and anthropology in this regard. The existence of productions, references and uses of logic, beyond academic circles and doctrinal investigations, have led us to approach logic from a historical sociological point of view.

This choice has proven all the more necessary since the producers and users of logic are not interchangeable subjects, but individuals and groups endowed with multiple social features—in other words, with sociological depth. Whether they are philosophers, scientists, jurists, anthropologists, theologians, doctors, clergymen, monks, social workers, educators, or computer scientists, the manipulators of logic represent social actors in their own right. Logic therefore constitutes an object in the hands of particular groups, as well as a creation and a property partly shared and disputed. Several sociological approaches can be used to account for this phenomenon. They may be of an institutional, interactionist, causalist or, for example, materialistic nature [19]. These approaches, and in particular those of materialistic inspiration, make all the more sense since logic is not reduced to a set of theories. It also refers to objects such as writings, practices, and norms. In order to account for them, it appeared essential to overcome a mere conceptual history of logic.

While trying to handle the problem of the (de)localization of logic, focusing on logical skills revealed to be an adequate and fruitful lever. The notion of embodied skill, which is both supposed to be realized in practice and to refer to abstract operations, offers a particularly suitable grip on objects that have often been perceived as having a dual dimension: a logic internal to the subject, on the one hand, and an external logic, which represents an ideal order or a normative horizon, on the other hand. If connecting actions and alleged competences is tricky for an analyst, the latter may study how the actors produce such connections. This makes it possible for us to place individuals and their actions at the heart of our investigations, and to avoid the pitfall that may represent, for historians and sociologists alike, direct investigations of brain processes or ideal objects. If such processes and objects are indeed nowadays available resources for addressing the issue of skills in disciplines such as psychology, cognitive sciences, or speculative philosophy, they are, on the other hand, difficult to grasp through the methods used in sociology and history. Furthermore, the notion of logical skills may help analyze how actors talk about such skills, describe them and associate them with specific practices.

While referring to individual aspects, this notion points toward collective and institutional modalities of acquisition, qualification, measurement, and deployment [30]. Insofar as these skills are generally attributed to more than one individual, possessed and transmitted by groups of varying sizes, and deployed in public, they have a social dimension from the outset [31]. Such social dimension is also blatant, for example, when skills offer advantages to groups that master them over those who do not, especially when they are synonymous with virtuosity and distinction [32, 33]. The study of the distribution of supposed or actual skills then offers insights into how certain individuals or groups are valued, and others discredited (e.g. educated elites versus uneducated people, "civilized" versus "primitive" individuals).

The notion of logical skills can also be connected to various large sociological categories, such as tacit knowledge [34], habitus, or disposition, which allows us to explore its various dimensions. Viewed as part of a habitus, this notion makes it possible to investigate how objective structures are embodied in individuals [35]. Logic can thus be grasped not as set of singular objects, but through the connection of the latter with other elements, such as the working of various institutions. Logical skills can also be understood in terms of dispositions linked to more or less homogeneous, coherent, and localized socializing experiences [36]. Such an approach makes it possible to trace diffuse relationships to logic in biographical trajectories, including in the learning stages.

Studying how individuals obtain logical skills offers resources for thinking about the nature of this process, depending on the socio-historical space in which it takes place. Analyzing, for instance, the writing and reading skills needed for the manipulation of symbols, as well as the work of hands and eyes implicated, and the use of different scriptural and visual tools allows us to identify the material dimension of the practice of logic, the physical skills it requires, as well as the phenomena of distributed cognition involving human groups and material devices [16]. It allows us to grasp what can be taken more or less for granted, locally and temporarily, at the level of logical practice, and, as a result, what can be debated and disputed.

It seems easier to conduct such an investigation on the contemporary period than on more ancient periods. The historian is often confronted with a limited number of artifacts, especially texts, while the sociologist who carries out empirical investigations on the contemporary period can meticulously observe the material and social conditions of production and manipulation of abstractions. The sociologist can grasp, for example, acts of writing on the blackboard, interactions between logicians, and thus a logic in action that is not reduced to pure reasoning, and that is neither immaterial nor simply localized in the mind. They can also grasp the embodiment of logic in computer technologies, and the various stakes—not only epistemic, but also economic and political—connected to such displacement [16]. Nevertheless, the study of theoretical practices and uses of logic, in their most concrete dimensions, remains possible over different periods in history, as long as a suitable focal is adopted. This makes it possible to account for the peculiarity of logical skills compared to other types of skills, for the specific properties of logical objects, as well as for their development and relative "success" in academic arenas and within societies. It allows us to think of logic in terms of uses, social demands,

and utility, in a context where learned societies, even when caught up in their disciplinary diversity, represent only one part of the field of investigation.

From the point of view of the history of logic, an inquiry focused on the notion of logical skills proves to be particularly meaningful to illustrate the fruitfulness of a social history of logic. It makes it possible to share logic as an object of inquiry with a variety of disciplines, and to go beyond the limits of a history of logical theories—an almost exclusive way of practicing history up to the present day. Specialists in the history of logic have generally shown little interest in the users and actors of logic, in the precise historical conditions of production, use and valorization of logic, and in logical practices at large; historians who have worked on possibly related topics have generally preferred (cautiously) to circumvent logical questions; the historical dimension of logic has been little taken into account since a project of sociology of logic was launched, on the basis of a "strong" program, where a unitary and abstract notion of logic was adopted [10]. A sociology of philosophical knowledge fully interested in the historical dimension of the social inscription of logic has, however, proven fruitful for the institutional and intellectual history of logic as a discipline in the contemporary period [37]. A few attempts at developing a social history of logic should also be noted. Some are sometimes rather fragile in their presuppositions and methods, as they try to embrace millennia of history in just but a few pages [38], while others, focusing on a clearly circumscribed historical context, have proven successful [39]. For the Middle Ages, a call for a radical *aggiornamento*, aiming at developing a social history of logic, was launched by John Marenbon in 2008 [40].

The notion of logical skills, associated with others, notably the notion of discipline, allows the historian of logic not only to benefit from a wealth of reflections from sociologists, but also to take advantage of the results already obtained in a set of historical fields that have already been well ploughed. These chiefly include the history of education, of scholarship and grammar, of places of knowledge and universities, of mental health and disability, of anthropology, race, and colonialism. The results obtained in these fields, when patiently appropriated, revisited, and combined with original investigations, allow us to lay the foundations for a historical sociology of logic and to show its fruitfulness.

The value of this approach is particularly obvious for historical periods in which logic began to really matter in society, beyond the restricted circles of the philosophical schools of antiquity, where logic did not belong to traditional Hellenistic education and represented a preparatory, accessory knowledge. This story begins in the Central Middle Ages. Being distinct from philosophy, whose boundaries were still subjected to complex negotiations when universities emerged at the beginning of the thirteenth century, logic was by then a well-established discipline that dominated the *trivium.* Logical practices were pervasive in intellectual and scholastic circles. Medieval argumentations followed a logical pattern, generally displaying an explicit formalization, or even sometimes including metalogical formulations. The syllogistic form was the very form of teaching in all disciplines, whether through commentaries or disputes, which were also the main modality of graduation in universities. Logical education became the basic training for the entire intellectual

elite, as well as for a part of the clergy and friars dedicated to pastoral duties. That period was also marked by a new concern about the anthropological dimension of logic ([1]; Brumberg-Chaumont, this volume).

The formalization of theoretical practices offered by logic, which goes hand in hand with a rejection of autodidactism, echoes a series of social and cultural transformations which, more broadly, have highlighted the notion of skill in an unprecedented manner during the Middle Ages. This emphasis on skill is expressed through the idea that practices need to be governed by the knowledge of the rules of art. This idea developed in the most varied fields, beyond the liberal and mechanical arts, as in preaching and confessing. The art of writing letters, the *ars dictaminis*, which formalizes legal-political writing practices of power [41] paralleled formalizing instruments that logic offered in the theoretical disciplines.

The Middle Ages thus represent a historical period when the social utility and value conferred to logic, as well as the logical formality of knowledge practices, were particularly high and endorsed—an attitude that was not peculiar to the Latin world, but that could be observed, *mutatis mutandis*, in the Arabic, Indian [42–47], Byzantine [48], and Hebrew [49] worlds.

Beyond this medieval starting point, studies in the historical sociology of logic are confronted with profound changes in the practices and representations of logic in different contexts during the early modern and modern periods, whether in Europe, in America, or in other areas [50, 51].

Rather than a normative study of logic in the course of history, social historians of logic study how logic becomes a norm from a sociological and historical point of view. They locate or relocate logic within a plurality of uses and configurations where the very concept of logic is subjected to a radical historicization. This history is rooted as much, if not more, in practices as it is in theories. Such an approach allows to build a multi-scale, global, multicultural, and decolonized history of logic. Logic is investigated across a wide range of disciplinary, documentary, geographical, and theoretical territories. A pluralized history of logic becomes possible once the normativity of the definition of logic as a formal discipline is discarded [52]. This definition became standard only lately, even in Europe and North America, that is to say during the first decades of the twentieth century, after the so-called 'Fregean revolution' [53]. Such an enterprise is possible when the pitfalls of the "comparative logic" once proposed by Paul Masson-Oursel [54–56] are circumvented, and when the inevitable counter-reference to an "oriental" logic (or lack of it), at the cost of erasing Africa from the map of logic, is dismissed [52].

Conceived as a type of skill which is native, internalized, valued, cultivated, theorized, and sometimes rejected, as well as a school discipline, logic thus belongs to a variety of fields beyond the history of philosophy. As part of the history of education, logic represents both a fundamental acquisition and a mode of acquisition from a normative point of view; it sometimes competes with other basic areas of knowledge, such as grammar, rhetoric and, later on, humanities and mathematics, over which it was sometimes preferred. It also belongs to the social history of scholarly circles. From the Middle Ages to the early modern period, it has constituted a language and a code which defined membership and prestige, well beyond the world of

universities, but which was also rejected when viewed as related to the sophistries of the so-called "scholastic method". Logic is also an integral part of the history of science. The logicality of knowledge is a central device when "science" is not only understood as a body of justified doctrines according to the modern concept, but as a habitus, a special state of the agent of knowledge, according to the ancient conception. This state relates to the fact of being "certain" and to an epistemological status for propositions, that of being "demonstrated."

A social history of logic also entails a history of logical flaws. Such a history connects the history of logic with yet another wealth of historical and sociological fields. A lack of logic, understood as a natural logical disposition or an artificialization of the latter in logical education, has led to regard some individuals and human groups as subalterns and to reject them at the margins of humanity. Such boundaries have been theorized by philosophy, law, medicine, theology, philosophical anthropology, and, later on, by social and political sciences. Using logic to "test" people on a large scale has given logic a distinctive discriminatory role within our societies, long after the disappearance of traditional logic from school curricula where it could still have a broader educational meaning. A historical sociology of logic should also explore the various anthropological, social, and political values associated with logic, under different modern names. They may be located within labels, such as "critical thinking," "argumentation," or even "rhetoric." These values are expressed in the education policies recently advertized by the European Union, which mention logical skills (as "critical thinking") as part of the fundamental "key competences" that education should provide [57]. These values are also conveyed by the debates on the educational goals of critical thinking at the undergraduate level in the USA [58].

Addressing the logical skills issue allows us to launch, in the very terms used by the actors themselves, a study of the notion of "natural logic" in the long run. Some elements of this history are studied in this volume. The notion of logical skills offers an opportunity to reflect on one aspect of the history of intelligence. Of particular interest is the historical and philosophical examination of the reversal process which led to locate the artificial logic taught in schools in the human mind, and then to present this artificial logic as a natural phenomenon. This was a medieval innovation whose implications are still far from being fully comprehended. A contemporary sequel has consisted, in particular, in some interpretations given to the notion of "artificial intelligence." They have consisted in viewing the working of computers as a model for human intelligence after having first described the latter in a computational way. This circular process has led to naturalize and view as a universal truth what was only one moment in the history of intellectual techniques. From the history of anthropology's viewpoint, the natural logic that was read in the very evolution of the living world as a form of intelligence, gave new forms of legitimacy to the theoretical elaborations of scholarly logic, once logic was freed from the straitjacket of traditional logic, during the nineteenth century.

This volume stems from an unfettered dialogue between a sociology of contemporary logic and a long-term social history of logic, and from the willingness to investigate shared objects and questionnaires. It focuses on the issue of logical skills

and views them as related to variegated uses and representations of logic developed in particular socio-historical spaces. It aims at understanding how some logical skills have been attributed or not to individuals or groups by third parties, including researchers in the human and social sciences, and on what grounds individuals and groups have claimed to possess these skills. This volume investigates how the actors have tested or highlighted logical skills in different contexts, applied various normative approaches to them, valued and criticized them. It also aims at relating these various values and representations to the actual uses of logic that can be observed in different social historical spaces.

In order to explore this field of study under construction, we have chosen to select two different lines of investigation. We first study how logic has been referred to in order to establish a divide between "primitives" and "civilized" people within humanity. Secondly, we look at how logic has been used to discriminate "mentally disabled" persons, and give the precedence to "normal" and "educated" people.

1.3 Presentation of the Contributions: The Scales of Logic

To what extent and in what ways has logic been invoked to distinguish between "primitive" and "civilized" men?

In chapter two, Scott Pratt shows how Lewis Henry Morgan's late nineteenth-century conception of natural logic as the engine of human progress was the breeding ground for migratory colonialism. This natural logic, which is sometimes also called by Morgan "intelligence," is illative: it consists in non-necessary but stable inferential connections that can be formally described, and are normative for agency. It is based, in the same manner as previous notions of natural logic, on the principles of non-contradiction, of excluded middle, and of identity. Pratt grounds the origins of the theories used by Morgan and other nineteenth-century anthropologists, linguists, and geographers, especially in authors belonging to the Scottish philosophy of common sense, such as Thomas Reid, among many others. He explores different formulations of the notion (whether named as such or not) after the Middle Ages, in the works of various authors, among which Reformation thinkers such as Donne and Calvin, then Locke, Kant, Hegel, and Hamilton. He explains the survival of Morgan's conceptions well into the twentieth century, i.e. in Lévy-Bruhl, Baldwin (who distinguished between pre-logical, logical, and hyper-logical stages in 1915), and Durkheim, despite great discrepancies. He follows it in Piaget's structuralism, where natural logic is not only the structure of thought, but also accounts for ongoing transformations of the latter. After the rejection of evolutionary schemes, the traces of this conception can still be read in Levi-Strauss's works, or among neo-materialist authors. He shows how Morgan's conceptions of natural logic have four implications in line with the project of migratory colonialism: the impossibility of making incommensurable worlds cohabit, the rejection of the idea of a polygenesis of humanity susceptible to upholding territorial claims, the deployment of a normative framework to measure the development of human cultures, and the elaboration

of an epistemic framework that justifies considering property as fungible and borders as temporary, not absolute. Morgan's natural logic thus favors the elimination of the ontological and cultural differences attached to the "uncivilized" people and to their property rights. Despite some evolution in the representations of natural logic, the consequences of Morgan's theories for colonialist ideology remained significant according to Pratt until the dawn of the twenty-first century. Pratt therefore proposes to adopt another logic, called the "Sigma system" by its inventor, Josiah Joyce, which could be the logic of a decolonial project. Contrary to the natural logic theorized by Morgan, which actually forms only part of the Sigma system, obtained by restriction, this decolonial logic is modal, dialeitheic, paraconsistent, and "ententional," that is to say: it takes into account the role of purposes and unrealized possibilities in the process of ordering and taking action. By offering an original overview of the wide range of contexts, disciplines, and theories in which the notion of natural logic has been used over history following the Middle Ages, Pratt illustrates how fruitfully logic can be studied from an interdisciplinary perspective. He makes it possible to connect, both historically and conceptually, an "objective" sense of logic, commonly implied today in expressions such of "the logic of X" (evolution, life, markets, epidemics, exclusion, colonialism, etc.), and a "subjective" one, the form of inferential thought implied in knowledge and action, thereby greatly extending the significance of the notion of logical skills.

Claude Blanckaert focuses on the theories developed by nineteenth-century French anthropologists. He shows how the latter thought of "intelligence" as a universally shared disposition, including animal species, while pointing out quantitative variations, as well as regressions among the "inferior races." Intelligence was a psychic disposition as well as a natural law of evolution, which, by its nature and function, comes close to the notion of "natural logic" used by the American anthropologist Morgan, and various other authors, studied in the previous chapter. Naturalist anthropologists believed that the intelligence of human beings and animals was related to the ability to establish logical relationships between ideas, as well as to biology. They argued that there were differences in degree between the mental capacities of humans, on the one hand, and animals, on the other. These differences were due to different levels of evolution. Before becoming humans, children were comparable to animals. Reaching adulthood, only the representatives of the "superior races" were capable of progress, in varying proportions depending on the individual. The idea of the "noble savage," typical of the early modern period, had clearly lost ground, and the mind of the "savages" could not be recognized in its own logic. It was defined in a negative way, put on a scale where it never departed from its nascent stage, and was thus thought of as "retarded." The savages remained children in the bodies of men. Some animals were even perceived as more rational than some simianized "savages." Since all living beings were endowed with intelligence, some naturalist anthropologists, under the influence of the model of embryological development elaborated during the 1830s, explained this phenomenon by invoking a regression, or even a reversion of progress in the "savages" at puberty. This was explained by a principle called the "law of opposites," which was clearly a dysfunction of the natural logic of evolution. "Savages" were thus perceived as

survivors, analogous to fossils on the surface of the earth, and as early sketches of humanity. In addition to the multi-faceted uses of logic explored in the previous chapter, where the discriminative use of natural logic and the relation between humans and animals with regard to logic were only briefly touched upon, Blanckaert's chapter explores yet other dimensions of the notion of natural logic, named "intelligence" by the authors studied. He shows how intelligence, based on logical operations (analysis, ideation, inference, and classification), is, as much as a skill, both a natural and a psychological law of development. This follows a conception of logic that was available after a naturalist approach had been taken on a logic already "psychologized" during the early modern period. He precisely studies how the notion of logic, or the lack of it, has been instrumental in a racialist location of some human groups at the verge of humanity; he explains the rationales that have been designed in order to explain the occasional failure of the logical process and the absence of logical skills, disclosing its logical expression, with the idea of a "law of the opposite."

In the course of the twentieth century, anthropologists, in the same manner as researchers in other disciplines in the human and social sciences, have developed various theories on the logical skills of peoples, and on the relationship between these skills and the rationality of individuals. This is illustrated by Claude Rosental in the fourth chapter of this volume. He discusses the important debates that have been going on for almost one century about the logical skills and rationality of the Zande people. The ability of members of this African ethnic group to reason and behave logically and rationally has been subjected to contradictory claims along the history of anthropology, sociology, and philosophy from the publication of Edward Evans-Pritchard's works to the present day. The study of these claims highlights the variability of representations of logic among authors in the human and social sciences, their sometimes basic or outdated features, as well as their impact on the evaluation of the more or less logical and rational character of "primitives." It shows, however, the extent to which analysts were reluctant to fill the world with irrational minds because of a lack of logic. The chapter presents a foundational case for the type of approach developed in this volume, since it not only shows how many twentieth-century thinkers were reluctant to deprive "primitives" from the same logical skills as those of Westerners, but it also presents the first encounter between anthropological reflections on the mentalities of "others" and the idea of a plurality of logics. By contrast, a previous and well-known episode of this discussion, the emergence of the notion of "pre-logical" mentality, elaborated by Lucien Lévy-Bruhl, shows that this author consistently remained within the framework of a unitary and monolithic conception of "the" logical norm, on the one hand, and, on the other hand, consistently measured "primitives" by means of a scale, with regard to logical skills, on which they were compared with Westerners.

Roberto Frega's analysis focuses on the pragmatist approach to logic developed by John Dewey in the wake of Charles Sanders Peirce's work. Frega highlights the four stages that have marked the evolution of logical thought according to Dewey, whether in the history of humanity, through the psychological development of individuals, or in the development of Western civilization. The first stage, which

corresponds to the "childhood" of logical thinking, is characterized by a natural tendency to systematically dispel doubt. It is embodied both in "primitive" modes of thought and in those of some modern people, in particular some philosophers, for whom doubt is synonymous with displeasure, irritation, and suffering. The absence of doubt means for Dewey the absence of logic, since logic is fundamentally defined as the exercise of critical thinking. Nevertheless, logic experiences a primitive rise, when the first questions begin to focus not on the rules themselves, but, because of their increasing complexity, on the identification of the rule under which such or such case must be subsumed: this is the logic of judgment. In a second phase, doubt is allowed, and leads to a certain instability of thought. This is the logic of argumentation, which is typical of the world of Greek rhetoric. It is controlled in the next stage by the development of methods of logical proof—i.e. the formalization and axiomatization of logic found in Aristotle's work. This stage is unsatisfactory, according to Dewey, because it lacks the possibility of extending doubt to the axioms themselves. Maturity is only reached in a fourth moment through the advent of experimental science. Investigations can then be carried out in many ways. Thought takes on a synthetic rather than an analytical shape. It moves from proof to "experiment." Beyond proof, the whole field of empirical facts is open to thought. Doubt is no longer feared or avoided. It is applied to all domains and grows into pleasure in which humanity as a whole indulges as it reaches its logical fulfilment. Dewey's conceptions of logic determine how the author approaches the issue of the relationships between "primitive" and "civilized" men. In line with the previous three chapters, this contribution thus helps to show how the development and the variations regarding the representations of logic—especially those held by researchers in the humanities and the social sciences—play an important role in the way "primitives" have been identified and characterized throughout history.

These representations have also determined the positions occupied by logically educated and mentally deficient people across history.

This is what Julie Brumberg-Chaumont first evidences in the sixth chapter of this book. Focusing on the Middle Ages and on the birth of universities, this chapter explores the moment when the possession of logical skills became a central element in the definition of intellectual elites in the history of Western Europe. The development went along the definition of an anthropological ideal, the logical man, from which large portions of society were excluded. The educational and anthropological model, constructed originally at the university of Paris, was disseminated across all disciplines, in law and medicine faculties beyond philosophy and theology; it progressively circulated all over Europe and was partially adopted and adapted in previously rhetorically orientated Southern schools and universities. Logic was a strongly unitary discipline guaranteed by the Aristotelian reference. It was the universal method for all disciplines recently reconfigured as sciences; it was to prevail in the order of learning. The notion of logical skill conveniently captures the way medieval thinkers conceived logic. Logic was a discipline, an "artificial logic," a habitus, like any other science in the Aristotelian tradition, and the underlying logic of sciences. It was also a native disposition and a natural logic developed by the rational soul. The social rise of logical skills is part of a wider cultural picture,

where skills at large represented a rising value in a medieval technical and intellectual environment which saw a multiplication of practical and theoretical guides—the *artes*. Logic had a special position in this context, since it was conceived as the knowledge that was itself guiding the acquisition and certification of knowledge. It was the "art of the arts" and the "science of the sciences," as it was increasingly defined at the beginning of the thirteenth century. The divisions of Aristotelian logic were for the first time naturalized and projected on the very structure of the human mind that was thereby "logicalized." By a reversion of the projection, the three-fold division of the logic taught in schools enjoyed a homothetic correspondence with the three operations it was designed to regiment: concept formation, propositional predication, and inference formation. The logicalization of the rational soul was instrumental for a new conception of logic as an anthropological norm, a phenomenon that strictly went alongside the rise of logic as a social and intellectual norm. The period was characterized by a large adoption of an intellectualist definition of man, and of the description of the human intellect as a *tabula rasa*, to be perfected by intellectual operations performed in actuality. Because of the necessity of a methodical acquisition of speculative science, which went along a complete discredit of any kind of autodidactism, the discipline of logic was thus deemed a necessary instrument for the perfection of man as an intellectual creature. Logical skills were conceived and promoted by a group of logically skilled, professional philosophers and theologians as a condition for a fully realized humanity, to the point of describing "men deprived of logical knowledge" as "worthless beasts, called 'men' in a homonymous way." In line with the previous chapters of the volume, the contribution by Brumberg-Chaumont shows the medieval origins of the notion of natural logic, the rise of the value of logical skills, and the birth of the anthropological dimension of logic, once logic had been naturalized and mind logicized. It endeavors to illustrate how historical and sociological studies of logic can fruitfully interact with other historical fields, especially history of education. It discloses the way a Northern logical model of education historically emerged, as the product of a series of determinate institutional, intellectual, political, and religious factors, and progressively took over other alternative models in various spaces, cultures, and disciplines. It shows how the elitist, ideal definition of a logically perfected man, developed in the anthropological and educational reflections by some medieval philosophers and theologians, went along a strongly discriminative use of logic. A great number of people—intellectually deficient people (*moriones*), insane people, children, women, peasants, illiterate people (*idiota*)—were thereby included in the category of "logically disabled people," and assigned to inferior forms of humanity.

The following chapter looks back at an earlier period, when the paradigm of logical reason had not yet dominated the medieval intellectual world. Dominique Poirel analyzes the disputes that arose in the eleventh century about the usefulness, place, and value of logic in addressing questions of faith. This dispute focused on problems that would later be called, from the twelfth century onward, "theological" in the modern sense of the term, as a consequence of a "logicization" of the method of thought. Monks opposed to dialecticians have been described by some historians of the early twentieth century as "anti-dialecticians," and presented as hostile to the

use of dialectics when dealing with questions of Christian dogma. This was an ideological move that was designed to value, by contrast, the heroes of rationalism. According to other scholars, the so-called "anti-dialecticians" proposed forms of rationality that were alternative to that of logicians, a "musical" and "harmonic" type of reasoning whereby opposites could co-exist, as opposed to a binary logical reasoning of the Aristotelian type. Poirel shows that this was not the case. Monks did not reject logic in any way, all the more so as they were proficient in the matter, theoretically and practically. Their condemnation in the name of an alleged opposition to logic was rather a power struggle. This chapter offers a contribution to the social history of logic in the Middle Ages, where it is shown that some of the values and uses of logic cannot be explained by analyzing only the content of arguments and theories. Three cultural factors played a role in this story. First, the Gregorian reform, which tended to insist on the autonomy of the religious in the face of secular powers; secondly, the 'logical turn' in studies which sought to provide faith with a universal and rational foundation, beyond any argument of authority; third, on a social level, the competition between the masters of the cloister and the masters of secular schools. The chapter illustrates the value various elites attached to the mastery of logical skills during the Middle Ages. It focuses on the moment when logic became, after being partially eclipsed during the High Middle Ages, a sought-after, renovated discipline, which began to be taught more widely in newly developed schools. Logical skills were not, however, overvalued; their role was negotiated in competition with resources of various types—argumentative, discursive, exegetical, analogical, literary, and so on.

In the eigth chapter, Irina Metzler shows how the perception of a lack of logical reasoning, abstraction, and language in some men served as a criterion in the Middle Ages to distinguish them from the rest of humanity, and in particular to give them a specific legal status. These can be named under the Greek term "alogon," literally those who cannot speak or reason. This notion could include mute people, children, mentally deficient individuals, and animals. Metzler shows how mentally deficient individuals could be considered as irresponsible for crimes under civil and canon law. Their lack of language and logical skills also affected their ability to testify in court or to sign contracts. However, some animals, such as pigs and other large domestic animals, were sometimes put on trial and convicted, unlike children and mentally deficient people. The attribution of some reasoning skills and a certain agency to animals cannot be regarded as the result of a popular belief, a notion pertaining to some "medieval mentality," since it is found in legal texts and practice, and even appears in the writings of some theologians. Although this apparent paradox could be explained by the fact that animals were considered to be in the custody of responsible humans, a symbolic interpretation seems more apropos. Faced with a criminal act, a purifying ritual could be performed in the form of a trial, in order to restore order in the most civilized way possible.

In the last chapter, Christopher Goodey analyzes how representations of logic have affected the perception of man's place in the natural order, from the Middle Ages up to the Enlightenment. In particular, he shows the origins of a way of thinking, which crystallized in psychology, and which consisted in distinguishing

individuals that escape the logic of "normal" development from the rest of humanity. Goodey first presents how readings of Aristotle, largely detached from the philosopher's conceptions, led medieval thinkers to consider the ability to reason logically as a definitional attribute of man, and to distinguish between the learned and the layman on this basis. Different professional elites stabilized this division in order to establish their expert status and increase their power. On the basis of a problematic overlap between the reception of grace and the full possession of reason, and, conversely, between damnation and the lack of reason, as it arose during the early modern period, logic served as a reference point and tool for many theologians to approach the issue of salvation. The whole process was then endorsed and displaced by Locke, in the new framework of a natural history of the mind. Goodey shows how the works of Rousseau, who can be considered a precursor of developmental psychology, are a continuation of this approach. According to Goodey, Rousseau took a decisive step by developing a temporal formulation of natural logic, whose rigor became that of the fixed stages of the individual development. This chapter also shows the role played by logic in the way mentally disabled people were approached in the history of societies, especially after the advent of a developmental conception of psychology remotely rooted in the religious history of salvation and its mental condition. More generally, it illustrates the social and political dimensions of the representations of logic and their uses throughout history.

The results presented in the course of this volume highlight some aspects of this history. But much remains to be done to explore all of them. It is therefore to be hoped that the approach here adopted will inspire other undertakings, thereby extending this field of inquiry to new documentary and intellectual frontiers.[2]

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Part I
“Primitives” and Civilized Men

Chapter 2
Decolonizing "Natural Logic"

Scott L. Pratt

Abstract "Natural logic" was proposed by Lewis Henry Morgan (1818–1881) as the engine of cultural evolution, concluding that the "course and manner" of cultural development "was predetermined, as well as restricted within narrow limits of divergence, by the natural logic of the human mind." This essay argues that Morgan's conception of natural logic aids the project of settler colonialism. Rather than being a false account of human agency, however, it is a conception of natural logic that is produced through the systematic narrowing of possibilities for agency, human, and otherwise. This narrowed logic is thus only a part of a differently conceived logic of agency that is also general (and so serves as the framework for all action) and normative (albeit with a set of norms different from those identified by Morgan). The discussion proceeds in four sections: first, a presentation of Morgan's conception of natural logic and its origins; second, an analysis of four colonizing implications of Morgan's view; third, examples of further developments of natural logic in the twentieth and twenty-first centuries in the work structuralist and post-structuralist theorists; and, last, a brief introduction of a decolonial logic that provides a broader alternative conception of the structure of agency, human, and otherwise, and that avoids the oppressive effects of the reductionism of the natural logic received from Morgan and his successors.

Keywords Lewis Henry Morgan · Natural logic · Agency · Structuralism · New materialism · Settler colonialism

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2.1 Introduction

In his 1877 book, *Ancient Society*, Lewis Henry Morgan introduced the concept of "natural logic" as an ordering structure that makes human development possible. Summarizing Morgan's conception, natural logic organizes human agency through illative (inferential) relations, such that certain antecedents in experience (circumstances, actions, propositional premises) lead via actions to certain outcomes (circumstances, actions, propositional conclusions). These illative relations between antecedents and outcomes have general formal structures, but also depend on felt or embodied connections. Natural logic thus involves both a pattern of connection and a sense that some activity, possible or actual, follows for the agent. From this perspective, formal logics provide abstracted descriptions of the general inferential forms of natural logic. These abstracted forms of inference can be taken as necessary, though actual inference still involves both the formal and felt connections. Natural logic contributes to Morgan's theory of human development in two other ways. First, it is universal, in that it underlies and has the potential to guide all human action. As universal, it is available to structure each action, but (since it is an illative relation and so not one structured by necessity), it never fully determines any particular action. Second, in light of its universality, natural logic establishes norms (sometimes described via formal logics) such that illative conclusions or actions can be judged as following from the given premises (circumstances, actions) or not.

While I accept the idea that agency—human and otherwise—is structured by an illative logic that provides a set of ordering principles for thinking and action, Morgan's conception of natural logic is problematic in that it aids the project of settler colonialism. Rather than being a false account of human agency, however, I believe this conception of natural logic is produced through the systematic narrowing of possibilities for agency. This narrowed logic is thus only a part of a differently conceived logic of agency that is also general (and so serves as the framework for all action) and normative (albeit with a set of norms different from those identified by Morgan).

I argue that the natural logic identified by Morgan and inherited by his successors has significant social and political implications. Emerging in American and European anthropology of the nineteenth century, it has persisted in the background of theory and serves as an element of the ongoing system of oppression that has come to be called settler colonialism, that is, the colonial effort to acquire land and eliminate its indigenous people. This narrowed framework for action, treated as universally (rather than generally) applicable, imposes a particular kind of reductionism on human experience that eliminates some human differences while reifying others through absolute boundaries (including national boundaries and the organizing dualisms of western thought: good/evil, white/black, men/women, culture/nature, and so on). Practically, a natural logic of this narrow sort provides a rationale (that is, a structure of reason-giving for outcomes that illatively follow from antecedents) for the removal of indigenous people from their lands and for the elimination of their cultures. At the same time, it serves as a normative structure that preserves the resulting system by judging reasoning as successful or not in terms of its illative patterns including its established dualisms.

The discussion proceeds in four sections. I first present Morgan's conception of natural logic as the engine of human progress and survey the origins of the concept. Second, I propose four colonizing implications of Morgan's view that underlie its support for settler colonialism. Third, I trace further developments of natural logic in the twentieth and twenty-first centuries through a series of thinkers, including the mid-twentieth-century structuralists, Jean Piaget and Claude Lévi-Strauss, in order to illustrate the persistence of something like Morgan's problematic conception. I briefly discuss the more recent work of post-structuralists called the "new materialists," including Karen Barad and Bruno Latour, who attempt to expand natural logic in response to the limitations of structuralism. Finally, I conclude with a brief introduction of a decolonial logic that provides a broader alternative conception of the structure of agency, human, and otherwise, and that avoids the oppressive effects of the reductionism of the natural logic received from Morgan and his successors.

2.2 Natural Logic and Human Development

In 1868, Morgan published a study titled *The American Beaver and his Works* in which he proposed the general organizing principle of what he would later call natural logic. Morgan was a unique figure in American intellectual history: renowned as America's leading anthropologist in the late nineteenth century, he became famous for his influence on Marxism, particularly on Friedrich Engels's book, *The Origin of the Family, Private Property, and the State* [65], and on the Marxist idea of primitive acquisition.[1] Morgan was born in Aurora, New York, in 1818, educated at Union College, and was admitted to the New York bar in 1840. In 1847, after his successful defense of a Seneca Indian land claim, he was adopted by the tribe and given the name, according to his biography, "'One Lying Across'—that is, a bridge or bond of union between the Indians and the white men" ([2], p. 222). In 1851, working with Ely S. Parker, a member of the Seneca tribe and later the first Native American Commissioner of U.S. Indian Affairs (1869–1871), Morgan published a treatise on the social and political structure of the Haudenosaunee, *League of the Ho-de-no-sau-nee or Iroquois* [67]. Over the next three decades, Morgan studied Iroquois social structures, eventually developing a general concept of social organization and kinship that extended beyond human societies.[2] At work behind the social structures he considered, Morgan proposed a pervasive organizing principle. In his study of the American beaver, the ordering principle he proposed and called "intelligence" was "indispensable to capacitate each [human and non-human animal] to maintain and preserve that life" ([4], pp. 249–251). Survival of each species depended on its

[1] Primitive acquisition is discussed at length in the context of settler colonialism by Coulthard [1].

[2] See Morgan [3].

ability to use the principle of intelligence to find the means to successfully address the animals' needs in changing environments.[3]

In his 1877 study, *Ancient Society*, Morgan reframed the principle of intelligence shared with animals as the engine of human progress.[4] Morgan wrote:

> … the principal institutions of mankind have been developed from a few *primary germs* of thought; and that the course and manner of their development was predetermined, as well as restricted within narrow limits of divergence, by the *natural logic* of the human mind and the necessary limitations of its powers. Progress has been found to be substantially the same in kind in tribes and nations inhabiting different and even disconnected continents, while in the same status, with deviations from uniformity in particular in stances produced by special causes. The argument when extended tends to establish the unity of origin of mankind. ([6], pp. 17–18).

The seven "primary germs" that are developed through the operations of natural logic are subsistence, government, language, the family, religion, house-life and architecture, and property. These germs are, according to Morgan, developed into cultural practices and institutions in three broad stages of human development (savagery, barbarism, and civilization) and each of these stages is likewise divided into three sub-stages. Natural logic plays the central role of "pre-determining," that is, constraining and affording, possible structures relevant to realize the needs marked by the germinal ideas. "Natural logic of the human mind" provided, he said, "nearly uniform channels" for disparate cultures to evolve. On this account, natural logic operates at all levels of development from the "lowest" sub-stage of "savagery" to the "highest" sub-stage of "civilization."

Natural logic, as Morgan uses the concept, is not a system of necessary laws, but a *system of illation* (inference) such that more or less similar results follow from similar antecedents. As such, natural logic functions for individuals as a kind of common sense ensuring more or less common responses to similar circumstances, actions, or premises in argument. These common responses, in turn, serve as the basis for the development of widely shared practices and institutions that likewise mark common responses to the needs for group survival framed by Morgan as the

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[3] James Martineau, *A Study of Religion: Its Sources and Contents*, shares Morgan's recognition of the presence of "intelligence" or something like it in non-human animals ([5], pp. 246–247, 262). Martineau labels the common framework "natural logic," suggesting that the concept was widely known or that, perhaps, he was familiar with Morgan's *Ancient Society* published eleven years earlier.

[4] Morgan links his earlier discussion of intelligence with the operations of natural logic in his comments on natural subsistence. "The maintenance of life, through the constant acquisition of food, is the great burden of imposed upon existence in all species of animals. [In] the highest structural form, that of man … Intelligence from henceforth becomes a more prominent factor" ([6], p. 20), suggesting that intelligence is present at every "level" but becomes more prominent (as does natural logic) at the level of human activity. Morgan echoes the discussion of natural logic in his concluding remarks as well: "A common principle of intelligence meets us in the savage, in the barbarian, and in civilized man. It was in virtue of this that mankind were able to produce in similar conditions the same implements and utensils, the same inventions, and to develop similar institutions from the same original germs of thought" ([6], p. 362). Also see Claude Blanckaert (this volume) for a discussion of the place of intelligence in vitalist evolutionary theory in the nineteenth century.

seven germinal ideas. Natural logic will consequently ensure that diverse human groups will respond to their common needs (such as the need for food or group organization) in more or less similar ways, depending on their circumstances and resources. The results will not be completely uniform (there are many foods that can provide for subsistence, for example), but they will, at least in this sense, mark what is common to humanity as a whole.

The developmental role of natural logic was not original with Morgan. In the 1820s, several authors studying indigenous American languages cite natural logic as the ordering principle that accounted for the origins of diverse languages. The shared natural logic behind these languages provided a way of accounting for differences between "savage" and "civilized" peoples. In the translator's preface to David Zeisberger's 1827 *Grammar of the Languages of the Lenni Lenape or Delaware Indians*, for example, Peter du Ponceau, President of the American Philosophical Society, observed that the vast diversity of human languages can be studied comparatively in light of "that tendency to order and method and that natural logic which God has implanted in the mind of every man" ([7], p. 13). While some accounted for indigenous American languages by claiming that America was "formerly inhabited by a civilized race of men," Ponceau said that it is more "natural to suppose that the Almighty Creator has endowed mankind with a natural logic which leads them, as it were, by instinct to such methods in the formation of their idioms as are best calculated to facilitate their use" ([7], p. 23).[5] Conrad Malte-Brun, a Danish geographer, writing in 1827, agreed with Ponceau: "Language, considered as a moral and physical faculty, appears then to be innate to man, but the choice of sounds, their modifications and their combinations, must have depended upon the will of man; natural logic has unquestionably had its influence, and, in addition to it, the passions of individuals, their habits, the delicacy of the organs, the nature of the climate, and the state of society, would all of them contribute to produce effects." The result was a process of development that eventually homogenized differences. "The *primitive tongues*," Malte-Brun concluded, "possessing a very scanty stock of words, simple as the manners of those by whom they were spoken, would naturally be lost by becoming confounded with the more perfect dialects which sprung from them, just as the primitive nations have disappeared, by merging in those nations celebrated in history, to which they had originally given birth" ([9], pp. 256–257).

The concept of natural logic, however, was taken to affect more than the structure and peculiarity of languages. It also served as an organizing principle for reason and action. While natural logic, in some sense, is discussed as early as the work of Aristotle and was developed more thoroughly in the Middle Ages,[6] the modern concept that underlies Morgan's work begins to take shape in the wake of the

[5] Bernard Sheehan, in his study, *Seeds of Extinction*, quotes Ponceau: "These elegant shades of expression [by Native American orators] show in a very forcible manner the beauty and capaciousness of the Indian languages, and the extent and the force of that natural logic, of those powers of feeling and discrimination, and of that innate sense of order, regularity, and method which is possessed *even by savage nations*" (emphasis added, [8], p. 108).

[6] See Metzler's and Goodey's articles in this volume.

Reformation and efforts to account for human reason in a world where all people, regardless of station or education, are able to understand the truths of Christianity. John Donne, an English Anglican priest and poet, for example, in a 1628 sermon, used "natural logic" to interpret Acts 28: 1-6 (the story of Paul's shipwreck on Malta). Donne argued that the "barbarians" encountered by Paul on Malta, as human beings, Christian or not, are imprinted with both "natural logic" and "natural religion." The first serves as the means by which humans know the world and the second, the means by which humans know God. Both faculties are fallible, since, as Donne observed, the former "strays into fallacies" and the latter "strays into idolatry" ([10], pp. 334–335), but together they form a common framework for understanding differences in belief and resources for bringing people to shared belief.

The distinction between natural logic and religion echoes a similar distinction in John Calvin's *Institutes of the Christian Religion* published in 1559.[7] Calvin claims that "God himself has implanted in all men a certain understanding of the divine majesty" ([11], p. 43). Further, even humans who do not hold Christian beliefs nevertheless share common ways of thinking. Such "natural men" depend only on the "light of nature" and possess human, but not divine, "wisdom" ([11], p. 280). Calvin quotes Paul in Romans: "If the Gentiles by nature have law righteousness engraved upon their minds, we surely cannot say they are utterly blind as to the conduct of life" ([11], p. 281). Significantly for Calvin and later for Donne, and in a different way for the evolution theory of Morgan, "The purpose of natural law … is to render men inexcusable" ([11], p. 282). Natural logic provides a structure that invalidates the claim that "man sins out of ignorance" and affirms that humans are provided with organizing and normative principles that are shared across all cultural and linguistic differences and provide a direction for human development toward "civilization."[8]

The concept of natural logic was developed in English philosophy in the mid-seventeenth century in the work of Richard Burthogge, a physician committed to philosophic study (like his contemporary John Locke). In 1678, he published *Organum Vetus et Novum, or Discourse on Reason and Truth wherein the Natural Logick Common to Mankind is briefly and plainly described*. Burthogge defined "natural logick" as "that of plain illiterate men, of which I designe to discourse, is the natural method of reasoning" ([13], p. 31). "Natural Logick," he continues, "is universal, a Logick of the whole kinde; so that what in Natural Logick is reason to one man, is so to all; for all having the same Faculties, and using them in the same

[7] Donne is familiar with Calvin's works and quotes Calvin's commentary on Acts 28 in his sermon ([10], pp. 335–336).

[8] Similar versions of this structure of natural reason or logic and natural religion are developed by earlier thinkers as well. Augustine, for example, on whom Calvin relied, claims that "the eternal law is stamped upon our minds" ([12], p. 11) and that "when reason, mind, or spirit controls the irrational impulses of the soul, a human being is ruled by the very thing that ought to rule according to the law that we have found to be eternal" ([12], p. 14). Reason, again, is the developmental faculty that at once distinguishes humans from animals ([12], pp. 13–14) and provides the resources for humans to become believers capable of doing good and so of being free.

Method, must needs come to the same issue, and by the same Principles arrive to the same Conclusion" ([13], p. 31). Such reasoning is in contrast to "Artificial Logick" which is the "logick of the Schools" and is useful for rendering one "more sagacious, circumspect and wary" ([13], p. 30).[9] As in Morgan's later development of the idea, natural logic that supports reasoning is part of the human as animal—"Ratiocination itself is an Animal act; not an abstract Action of the Soul, but a (Concrete) act of the animal; it is the Man reasons" ([13], p. 38). John Locke comes to a similar conclusion: "For if [animals] have any ideas at all, and are not bare machines, (as some would have them,) we cannot deny them to have some reason. It seems as evident to me, that they do (some of them in certain instances) reason, as that they have sense; but it is only in particular ideas, just as they received them from their senses" ([15], p. 208). For both Burthogge and Locke, humans and non-human animals share the capacity of reason, while humans alone are able to apply this capacity to abstractions. The ordering structure of reason makes possible the human search for truth and constrains it by establishing certain logical laws. "And 'tis common sense," Burthogge claims, "that what is congruous is true, and what is true is congruous; so common that none ever fancied any notions of Truth but in congruity" ([13], p. 42).

Burthogge's work owes a debt to the Cambridge Platonist school, particularly to the work of Henry More. In *An Antidote against Atheism* published in 1662, More criticizes the empiricist view that Locke would advocate in his 1690 *Essay Concerning Human Understanding* that the "soul" or "mind of man" is originally "white paper" that can "receive any character" through "experience" ([15], p. 87, 121).[10] More concludes that "the Soul is not unfurnished for dictating of truth unto us, I demand of any man, why under a pretense that [the soul] is having nothing of her own, but may be molded into an assent to anything, or that [the soul] does arbitrarily and fortuitously compose the several Impresses she receives from without, [the man] will still be so squeamish or timorous as to be afraid to close with his own faculties, and receive Natural Emanations of his own Mind, as Faithfull Guides" ([16], p. 18). While More does not use the term "natural logic," it seems clear that his system presumes a shared method of reasoning that serves as a means to access both ordinary truth and truths of God.

In 1732, Claude Buffier, a French Jesuit philosopher, proposed another version of the concept of natural logic. In his seven volume *Cours de Sciences* [64], he anticipated the common sense philosophy of the Scottish Enlightenment that emerged in the work of Thomas Reid and his colleagues in Edinburgh in the

[9] See Hoenen [14] and Brumberg (this volume) for a discussion of the medieval distinction between natural and artificial logic.

[10] Locke writes "I know it is a received doctrine, that men have native ideas, and original characters, stamped upon their minds in the very first being" ([15], p. 121). The first book of Locke's essay is dedicated to refuting this idea, while the second book affirms that reason involves certain structures that are from nature and underlie both human and non-human animal reasoning ([15], p. 213 ff).

mid-eighteenth century [17].[11] Buffier, like Burthogge, asserts the medieval distinction between "natural" and "acquired" logic. The former, he claims, is "the rational faculty itself with which every human individual is endowed, through which all are qualified for knowledge and discrimination of truth, and which, in proportion as a man employs the less, the less he is removed from irrationality" (quoted in [18], p. 237). Acquired logic is the *knowledge* of the "the Rules" according to which natural logic operates.[12]

The "rules" of natural logic were likewise associated with "common sense." William Hamilton, a leading British philosopher in the first half of the nineteenth century, who quotes Buffier in his *Lectures on Metaphysics and Logic* (published posthumously in 1874), acknowledges Buffier's distinction and argues that the science of logic shows that natural logic "can only be exerted under the general laws of Identity, Contradiction, Excluded Middle, and reason and consequent, and through the general forms of concepts, judgments, and reasonings" ([18], p. 3). Richard F. Clarke, a mid-nineteenth-century logician, agreed: "Natural and innate Logic consists of the body of unwritten law which nature imposes on all rational beings, and which all correct thinking obeys. It is born in us and we cannot run counter to it" ([20], pp. 23–24n2). Like Hamilton, Clarke also affirms that natural logic includes universally applicable laws that set the limits and possibilities of human thinking and action; for Clarke these are the laws of identity, contradiction, excluded middle, and causation ([20], p. 33).

Immanuel Kant also identified natural logic as foundational. In his posthumously published introduction to logic he concludes that "natural logic or the logic of common sense (*sensus communis*) is actually no logic but an anthropological science that has empirical principles only in that it deals with the rule of the natural use of the understanding and of reason which can only be cognized *in concreto*, thus without their consciousness *in abstracto*" ([21], p. 20). In this case, Kant denies that natural logic is a science (that is, knowledge of the operative principles), but affirms that it provides the subject matter for such a science. The necessary and universal rules of thinking, he says, "can be found at first only by observing natural use" ([21], p. 20).

Georg Wilhelm Friedrich Hegel develops the distinction between common sense and science differently. For Hegel, "so much is logic natural to the human being, is indeed his very *nature*" ([22], p. 12). The forms of thought, including the categories,

[11] Marcil-Lacoste argues that, while they share the overarching idea that there is an organizing structure for human thought and action that is innate, Buffier and Reid diverge in the details of their concepts of common sense. Some have suggested that Reid's concept of common sense was simply plagiarized from Buffier's early work. Marcil-Lacoste demonstrates that it was not and, though Reid read Buffier's work, his view emerges from a different context and set of concerns closely related to those shared by the other thinkers of the Scottish Enlightenment and different from those of Buffier.

[12] George Campbell, writing in 1776 in *The Philosophy of Rhetoric*, declares that Buffier was the "first among the moderns" to "take notice" of common sense. Reid "set [the doctrine] in clearest light and supported [it] by invincible force of argument" ([19], p. 60n).

that is, "thought determinations," are the work of unconscious "natural logic" ([22], p. 15) but are "set out and stored in human *language*, [such that] one can hardly be reminded often enough nowadays that thought is what differentiates the human being from the beast" ([22], p. 12). The connection of the forms of thought to language provides both a way to engage the operations of natural logic and a standard in terms of which languages can be judged. Chinese, for example, because of its relative lack of prepositions and articles "has apparently not advanced very far culturally, or at least not far enough" ([22], p. 12). German, on the other hand, "has many advantages over other modern languages, for many of its words also have the further peculiarity of carrying, not just different meanings, but opposite ones, and in this one cannot fail to recognize its speculative spirit" ([22], p. 12). Scientific thought, which is conscious and bound to language, takes as its subject the "thought determinations" of natural logic. "We do not indeed say of our feelings, impulses, interests, that they serve us." Rather, they "count as independent forces and powers, so that to have this particular feeling, to desire and to will this particular thing, to make this our interest – just this, is what we are" ([22], p. 15). The task of scientific thought is "to bring to consciousness this logical nature that animates the spirit, that moves and works within it" ([22], p. 17). Such thinking is essential to human development and freedom. "[W]hen the content that motivates a subject to action is drawn out of its immediate unity with the subject and is made to stand before it as an object, then it is that the freedom of spirit begins" ([22], p. 17). As with Morgan, natural logic is the ground of human development but, where success for Morgan is bound up with achieving the stages of development, Hegel frames development both as individual freedom and as the collective development of a language and a science that can foster such freedom. Put another way, "To purify these categories [of natural logic] and in them to elevate spirit to truth and freedom, this is therefore the loftier business of logic [as a science]" ([22], p. 17).[13]

The idea of natural logic Morgan presents in *Ancient Society* probably grows more directly out of philosophical discussions of logic and human development in the context of the Scottish common sense philosophy which in turn grew in an intellectual environment that included the work of thinkers such as Donne, More, and Burthogge.[14] Although it is not clear what works Morgan may have studied, it is clear that the philosophical milieu of American colleges and universities during the first half of the nineteenth century was dominated by the work of Thomas Reid and his Edinburgh colleagues.[15] All of these thinkers shared a commitment to giving an empirical (rather than rationalist) account of human mind and action and to the idea that there are common structures of perception and sentiment, as well as certain

[13] See Ficara [23] for further discussion of Hegel's concept of natural logic.

[14] Marc Swetlitz argues that Morgan was strongly influenced by common sense philosophy at Union College ([24], p. 59).

[15] Including Dugald Stewart (philosophy), George Campbell (philosophy and rhetoric), William Robertson (history), Francis Hutcheson (moral philosophy), and Adam Smith (political economy).

knowledge claims, that ensure at least potential agreement on moral, political, and economic matters.[16]

The connection between Morgan and Reid is perhaps most clear when considered in light of Reid's definition of common sense that, like Morgan's natural logic, provides a common structure in terms of which ideas and institutions can be developed. Common sense is "an inward light or sense … There is a certain degree of it which is necessary to our being subjects of law and government, capable of managing our own affairs and answerable for our conduct toward others. This," Reid concludes, "is called common sense, because it is common to all men with whom we can transact business or call to account for their conduct" ([28], p. 559). And common sense "is always and all places the same" ([28], p. 569). On Reid's account, common sense is one of two "offices" of reason, namely the second one: "The first [office] is to judge of things self-evident; the second to draw conclusions that are not self-evident from those that are" ([28], p. 567).[17] Despite the distinction, common sense does not stand separately from what Reid calls demonstrative reasoning, that is, the invention of proofs "by which, truths remote from the premises are brought to light" ([28], p. 713). Rather demonstration is a more formalized version of common sense connected by a structure that affirms the rules that are operative in

[16] Other philosophers who used some version of natural logic in their work included Dugald Stewart, George Jardine, and John Jay Elmendorf. Stewart, in *Elements of the Philosophy of the Human Mind* first published in 1792 held that "natural logic … is exemplified in the generalization of mathematical concepts" ([25], p. 82). "The steps by which [analysis] proceeds in quest of the thing sought, are faithfully copied … from natural logic which a sagacious mind would employ in similar circumstances; and are, in fact, but a scientific application of certain rules of method, collected from the successful investigations of men who were guided merely by the light of common sense" ([25], p. 258). George Jardine, another Scottish Philosopher, published *Outlines of Philosophical Education*, a popular textbook in the United States, in 1818. Jardine wrote: "But though, by this Natural Logic, as it may be called the Understanding may be so Improved as to answer the Practical Purposes of Life, it will frequently happen, in certain cases where Man is called upon to Exercise his reason, that the Assistance of Art may be extremely useful" ([26], p. 131). Jardine criticizes English and Irish Colleges for their "total neglect of mental Philosophy, and of natural logic which is founded upon the knowledge of our intellectual powers" ([26], p. 470). Finally, mid-nineteenth-century thinker, John Jay Elmendorf, in his *Outlines of Lectures on the History of Philosophy*, traces the origins of "natural logic" to the sixteenth-century logic of Peter Ramus (whose approach was widely used in British and American schools and colleges). Elmendorf observed that in Ramist logic "There is a natural logic of which the dialectic art must give scientific account; it consists in (*a*) invention, finding principles to solve the question; (b) judgment, attaining from this proof. For (a) [Ramus] gives commonplaces, from which arguments can be attained; for (b) he shows how to apply them in judging rightly; (α) by syllogizing, (β) by arranging, collocating as a whole, by definition and decision. The 'Ramists' formed a party in Eng[land], Ger[may], and France. Milton translated his dialectics" ([27], p. 148).

[17] For Reid, "judgment" is "the assent we give to a proposition" and reasoning "is the process by which we pass from one judgment to another which is the consequence of it" ([28], p. 710), what Reid calls the "power of inferring, or drawing, a conclusion" and what I have called illation. The "highest talent" in reasoning is demonstrative reasoning where "In every step …, the inference is necessary, and we perceive it to be impossible that the conclusion should not follow from the premises," but reasoning also includes probable reasoning. In each case, as in illation, the connections between premises and conclusion are both formal and felt.

natural logic. As Reid observes: "A conclusion drawn by a train of reasoning from true principles cannot possibly contradict a decision of common sense, because the truth will always be *consistent with itself*" (emphasis added, [28], p. 568), that is, "coherent" or in More's terms, "congruous."[18] Here, common sense is the illative response to circumstances (the judgment of self-evident things) and "reason" provides the structure that allows "facts" to serve as premises from which further conclusions follow probabilistically or by necessity. Like the natural logic of Hamilton and Clarke, Reid's is also marked by the expectation that each act or claim that follows will be consistent with its antecedents. In fact, Reid concludes those who fail to assent (to judge as true) the results of such operations fail to be fully human. "And a man who perfectly understood a just syllogism, without believing that the conclusion follows from the premises would be a greater monster than a man born without hands or feet" ([28], p. 632).[19]

2.3 The Colonizing Implications of Natural Logic

The social and political impact of Morgan's natural logic when taken up into the dominant culture clearly supports the settler colonial project. Settler colonialism differs from colonialism as understood in its original context of the history of empires, especially the British Empire. While colonialism's intent was to extract wealth from its colonies by exploiting their labor and natural resources, settler colonialism, as it occurred in North America, Australia, and New Zealand, was primarily interested in land. Rather than being an event like an invasion or a period of economic exploitation, Patrick Wolfe [29] argues that settler colonialism is a system of removal and elimination aimed at acquiring land, operating according to what he called "the logic of elimination." This is accomplished by occupying a place, vanishing its indigenous population, and finally forgetting that they were ever present.

[18] See Reid [28], pp. 16–17, on *reductio* and conditional proofs for the formal version of the limitation.

[19] George Campbell, one of the major philosophical figures of the Scottish Enlightenment, made the connection between the common sense of Reid and Buffier explicitly part of natural logic. In *The Philosophy of Rhetoric*, Campbell argues "Logical truth consisteth in the conformity of our conceptions to their archetypes in the nature of things. This conformity is perceived by the mind, either immediately on a bare attention to the ideas under review, or mediately by a comparison of these with other related ideas Evidence of the former kind is called intuitive; of the latter, deductive" ([19], p. 57). Common sense is presented as a form of "intuitive evidence" since it serves as an "original source of knowledge common to all mankind," even though "in different persons, it prevails in different degrees of strength" ([19], pp. 60–61). Those who are "originally and totally destitute of it" are "accounted a monster in his kind: for such doubtless, are all idiots and changelings" ([19], p. 62). He begins the following chapter of his treatise by stating that "in the preceding chapter [he] endeavored to trace the outlines of natural logic" ([19], p. 83). See the articles by Brumberg, Goodey, and Metzler in this volume for discussion of the relation of natural logic to people viewed as intellectually deficient including those with disabilities and those of so-called "inferior" races.

Morgan's account of human development based on the operations of natural logic provides a theoretical framework that directly supports settler colonialism.

Morgan's version of natural logic suggests four key implications consistent with the process of settler colonization. The first is that natural logic presumes ontological uniformity. That the illative relations of natural logic can be generalized across diverse situations presumes that the world in which various agents act is ontologically the same world. That human development can follow uniform channels means that human capabilities are more or less the same and the world to which they are applied is also in common. In effect, the operation of natural logic presumes a common reality that can serve as the final arbiter of human efforts to realize the seven "germs." Ontological commonality rules out the possibility that, rather than a single world, there are different and potentially incommensurable worlds of the sort William James called the "pluralistic universe" or the "pluriverse" [30] or of the sort asserted by indigenous American authors including Richard Atleo [31], George Tinker [32], Vine Deloria, Jr. [33] among many others.[20] Ontological uniformity is a necessary condition for framing both the practice and justification of the process of settler colonization.

Second, natural logic implies that humans share a common origin. A shared world and a shared structure of agency, framed by the quest for survival, mean that, despite human cultural differences, the similarity of goals and efforts to achieve them supports the conclusion that humanity also shares origins. The conclusion was an important one in the late nineteenth century as a means of opposing both racial conceptions of different human species and indigenous land claims based on the origins of different peoples in different places. Among the accounts of human development at the time was the idea that humankind was not a single species. Instead, racial categories were different species with different origins. This idea of polygenesis was supported by such thinkers as Samuel George Morton, Josiah Clark Nott, George Gliddon, and the head of Harvard's Lawrence Scientific School, Louis Agassiz. Before the Civil War, polygenesis was part of the rationale for slavery; after the war, the view was used to build a case for Jim Crow segregation and immigration laws meant to protect the USA from the influx of non-Anglo-Saxons. At the same time, indigenous thinkers also argued for a placed-based version of polygenesis that could in part account for why indigenous peoples had a prior claim to the land of North America (in short, because Europeans originated in homelands in Europe and Haudenosaunee, Lakota, Ojibwa, and Diné peoples, for example, originated in specific places in the Americas).[21] The rejection of the idea of polygenesis supported the project of settler colonialism by nullifying indigenous land claims and set the stage for the elimination of indigenous culture as well.

Third, natural logic provided a normative framework for measuring the development of diverse human cultures. Since natural logic provides the resources for connecting present circumstances with what follows as a result of human action, making

[20] Also see Pratt [34].

[21] These issues also emerge in the transcript of a debate between Ojibwe leaders and a group of Jesuits in 1844 [35].

the right choices is a matter of understanding and acting in accordance with it. Natural logic is presumed to be active whether or not it is understood, though an advantage of knowing that it is operative in human development is that it can then be harnessed to help people do the right thing. While Morgan does not make the point directly, it appears that natural logic—since it is always present in human thought—also operates as a set of norms aimed at the improvement of individuals and groups and, ultimately, humanity as a whole. The resulting norms provided justification for the establishment of Indian Boarding Schools that contributed to the genocide of American Indians in the years after the US Civil War. The aim of these schools was to use the presence of natural logic (or something like it) as a resource for transforming children of indigenous nations into "civilized" adults by eliminating the use of indigenous languages and material culture.[22]

Natural logic also acts as a normative framework by providing a means of understanding the progress of different cultures. In relation to the germinal idea of subsistence, the role of natural logic as a norm emerges, not in the particulars of a given period of subsistence, but in adopting the next form. According to Morgan, the diet of the first humans was nuts and berries, eventually subsidized by fish. The sequence is, in a sense, optional, but that there would be a next, more advanced, food source was not. The situation is parallel to the process of valid reasoning. Given two premises, "all humans are mortal" and "Socrates is human," the conclusion "Socrates is mortal" naturally follows. The relation between the premises and the conclusion is illative—the conclusion follows formally *and* in terms of felt expectations of what follows from the premises. Likewise, those living on nuts and berries, when presented with a means to add fish to their diet would do so if they encountered fish and the means to catch them. To fail to add fish would be to miss the "natural" logical implications of the present situation.[23] Progress in the modes of subsistence (from berries to fish to hunted meat to domesticated meat) "follows" from natural logic and so is also a norm for progress.[24] From this perspective, it is easy both to reject

[22] See Adams [36] and Pratt [37].

[23] One might argue that the syllogistic example follows necessarily and eating fish does not, and so the analogy fails. On the contrary, the structure of the syllogism allows alternative ways of verifying the illation, but the illation is still dependent on the felt connection between the premises and conclusion just as the move from berries to fish is felt to be necessary.

[24] In his discussion of marriage practices, Morgan concludes about the successive forms of marriage that "they stand to each other in a logical sequence and together stretch across several ethnical periods from savagery to civilization" ([6], p. 413). About the changes in Greek forms of government, Morgan concluded: "But the transition was not only natural but inevitable if the people followed their ideas to their logical results" ([6], p. 275). The conditional is important in that human progress is only inevitable if the people follow natural logic. The move would be natural in the sense that it was available to the people within nature but it was also necessary in that advancing to the next stage was a consequence of the structure provided by logic. Progress in this sense is properly agential and so accidentally adding fish to one's diet does not count as progress unless it is the result of the illative connection between the present state and the next one. If the accidental addition of fish is reversed (by some change in the availability of fish, for example), then the change would have no effect. If fish were added as a result of illation, the group would respond by trying to locate more fish.

scientific racism and its account of cultural differences and to adopt a view that at once affirmed the unity of humankind and rejected the so-called "primitive" cultures. By providing norms for the evaluation of different cultures and resources for teaching and learning, natural logic can frame the culture-oriented efforts of settler colonialism to eliminate indigenous cultures and, in the process, eliminate their historical and conceptual connections to their lands.

Fourth, natural logic makes for a kind of accessibility both epistemic and practical. Epistemically, Morgan's conviction that all human beings, regardless of their experience of the differences of race and culture, nevertheless operate through natural logic so that when knowledge claims produced within one group appear strange, even incomprehensible, these claims are still in principle knowable, thanks to the underlying structure of illation. By understanding the germs that frame human activities and the illative process that accounts for the transition from one stage to another, epistemic differences are simply moments that call for more reflection because, in fact, with sufficient knowledge of logic and the world, even the strangest claims can be grasped.[25] Natural logic, from this angle, also rules out different epistemologies including most standpoint theories and indigenous traditional knowledge.

Likewise, the practices that follow from natural logic ensure a developing commonality of economic and political structures. Despite what Morgan recognized as radically different conceptions of land and ownership, the operations of natural logic would eventually standardize such ideas. "The idea of property," Morgan claimed

> was slowly formed in the human mind, remaining nascent and feeble through immense periods of time. Springing into life in savagery, it required all the experience of this period and of the subsequent period of barbarism to develop the germ, and to prepare the human brain for the acceptance of its controlling influence. Its dominance as a passion over all other passions marks the commencement of civilization. It not only led mankind to overcome the obstacles which delayed civilization, but to establish political society on the basis of territory and of property. ([6], p. 6)

On this account, the same natural logic that makes the various stages of the development of property possible also made land itself accessible to "anyone" as a condition of human advancement. As land becomes fungible property, the boundaries, physical and otherwise, become useful as means to support trade but in principle are never un-crossable. From this angle, a kind of cosmopolitanism is the practical result of natural logic, such that those who understand the nature of progress and human difference can also see that boundaries among places are never impassible.

[25] Reminiscent of Donald Davidson's repudiation of incommensurable conceptual schemes [38], Morgan (like Davidson) could argue that if there were such radically different cultures that their claims were in fact incommensurable, then such cultures would at least not be human. If they are human, however, then with sufficient engagement and attention to the circumstances, the goals (that is, the germinal ideas) and the bridge-like structure of natural logic would ensure that the knowledge of these other cultures would always (eventually) be accessible.

Morgan, viewed in his day as an advocate for Native people, nevertheless gave voice to a view that would systematically eliminate from the world the cultures of those who had not yet achieved the stages of civilization. This is because the illative structure of natural logic demands, for example, that America's indigenous peoples' transition from a state of savagery—marked by the lack of what European settlers considered "common sense" principles like private property—to that of civilization. By "killing the Indian and saving the man" as Richard Henry Pratt explained it ([39], p. 46), American Indian peoples as peoples could be transformed into the next stage. By actively teaching them how to be transformed in this way, Indian schools and policies would use the normative power of natural logic to make new Americans, ones who would adopt the proper foods, family life, language, religion, and, most importantly, the concept and practices required for the establishment and maintenance of property.[26] In its ontological commonality, natural logic rules out the presence of different "real" worlds and the origins of different peoples in particular places. Because it provides the norms of progress, natural logic justifies practices that force individuals to conform to the stages of progress and its principles of access mean that no cultural group is inaccessible epistemically or practically. In short, natural logic is a crucial part of the logic of elimination for settler colonialism.[27] By eliminating ontological difference, extinguishing land claims, and erasing cultural difference, natural logic helps settlers acquire the land, remove indigenous people, and erase their history by folding it into a larger, unitary, ongoing narrative of human progress.

2.4 Structuralism and Natural Logic

One might regard Morgan's understanding of human development as long outdated. Yet the structural aspects of his concept of natural logic appear to persist as part of the theory and practice that emerged after the US Civil War and which came to underlie the mainstream conceptions of human development and agency both in the USA and Europe throughout the twentieth and into the twenty-first centuries. Looking back, Morgan's work stands out as a moment in this line of thinking as an account synthesizing both human difference and the possibility of human unity. The central theoretical move by Morgan was to propose a structure that could account for "progress" toward "civilization" that included steps or stages but provided sufficient openness to account for diversity and degrees of success and failure. As illative, rather than necessary, natural logic both directs human development and provides the means by which cultures and practices can be judged. In the years following the publication of *Ancient Society*, subsequent thinkers took up the task of providing an account of human development that could do the same work. The

[26] See Pratt [40].

[27] See Wolfe [41] for a discussion of the settler colonial "logic of elimination."

result is an array of accounts, rarely called "natural logic," but adopting more or less the structures synthesized by Morgan.

Where Morgan argued that natural logic supposed a continuum between the stages of human development, Lucien Lévy-Bruhl maintained the developmental and normative aspects of natural logic but understood them in terms of a sharp distinction between "primitive" and "civilized" people marked by the absence or presence of logical thinking. Primitive people, on his account in *How Natives Think*, first published in French in 1910, are characterized by "pre-logical" thought that "does not bind itself down, as our thought does, to avoiding contradiction" ([42], p. 78). Instead, such thought is committed to the so-called "law of participation" where "objects, beings, phenomena can be, though in a way incomprehensible to us [civilized people], both themselves and something other than themselves" ([42], p. 76).

James Mark Baldwin, an influential American psychologist and philosopher, affirms Lévy-Bruhl's distinction and argues that "[Primitive peoples] do not seem to be troubled by the demand we make upon our experience that it be consistent. They do not feel the need of rejecting a thing because they have accepted its opposite. Their canon of acceptability is something quite different—emotional and conative satisfaction, the fulfillment of a social interest. This really arises from … the state of absence of a classification which requires mutual exclusion and exhaustion" ([43], p. 65). Baldwin argues that human development is a process that involves three stages: pre-logical, logical, and hyper-logical ([43], p. 7). Pre-logical thinking is characterized by "All the motives of an illogical and unlogical sort, called, from the point of view of superior logical development, superstition, fanaticism, prejudice, mysticism and self-contradiction, together with the motives arising from the social rapport itself, both individualistic and collectivistic" ([43], p. 44). The logical stage frees individuals from limiting social ties. "Through thought there is a freeing of the mind from the inadequacies and inaccuracies of first-hand and uncritical acceptance; processes of personal judgment and logical grounding succeed the ready formulas and conventions of reality-feeling and social convention" ([43], p. 22). The final stage is the hyper-logical, or aesthetic stage, that is "a freeing *from* thought, as the [logical] is a freeing *of* thought" ([43], p. 24).

For both Lévy-Bruhl and Baldwin, observed cultural practices and widely held beliefs of indigenous peoples violated the norms of natural logic. Rather than holding that these peoples simply violated the available standards, declaring them pre-logical provided a means of explaining their non-conformity as outside their control. When natural logic was introduced to them (by evolution or education), the so-called primitive people could see the better alternative and adopt it. While Baldwin remained committed to the idea that the stages of human development were framed by different sorts of logic, Lévy-Bruhl eventually reversed his conclusion declaring "[the minds of primitive people] do not differ from ours from the logical point of view, not only in their structure but also in the manifestations of their activity" ([44], p. 62). Natural logic was (as previous theorists had held) present in all human beings and provided the resources for the evolution of "primitive" people to a "higher" stage of civilization. Both positions reinforced the idea that conforming to the norms of natural logic was a necessary condition for progress.

Lévy-Bruhl's and Baldwin's contemporary, Émile Durkheim, took a somewhat different approach to account for human progress. For Durkheim, "natural" logic is a product of human society. "Logical understanding," he argued, "is a function of society, since logical understanding adopts the convention and viewpoints that society imprints upon it" ([45], pp. 238–239). "Logic" in this case refers to both the concepts in terms of which a society is organized and the operative principles that frame the concepts. From his perspective, "to attribute social origins to logical thought is not to denigrate it, diminish its worth, or reduce it to no more than a system of artificial combinations—but is, quite the contrary, to relate logical thought to a cause that naturally implies it" ([45], p. 445). The principle of non-contradiction, despite its apparent centrality to modern thought, does not rigidly hold across all societies. "Granted, if primitive thought had the sort of universal and abiding indifference to contradiction that has been ascribed to it [by Lévy-Bruhl], on this point it would contrast—and contrast very markedly—with modern thought, which is always careful to remain internally consistent" ([45], p. 240). The reference here is not to contradictions per se, but rather to the contraries accepted by a given society. "If the primitive puts together things that we keep separate, inversely, he separates other things that we put together, and he actually conceives of those distinctions as abrupt and pronounced oppositions" ([45], p. 240). Hence, the "abiding indifference" to contradiction in "primitive thought" is better understood as the practice of dividing the world differently from "modern thought" such that what are contradictions for modern thought are not from the "primitive" perspective. Durkheim concludes: "I do not believe it possible to characterize the mentality of the lower societies by a sort of one-sided and exclusive inclination not to make distinctions" ([45], p. 240), thus rejecting both Lévy-Bruhl's and Baldwin's view that there is a "pre-logical" stage of development.

Durkheim's view has the virtue of recognizing conceptual differences while reaffirming the ordering principles—something like Morgan's "natural logic"—that frame diverse cultural "logics." As logical thought develops, it "tends more and more to jettison the subjective and personal elements that were launched with it" because "a new kind of social life gradually develops" ([45], p. 446). As a result, the structures of natural logic provide a framework for the progressive development of logic as a system of concepts. "Thought that is truly and peculiarly human is not a primitive given, there, but a product of history; it is an ideal limit to which we come ever closer but in all probability never attain" ([45], p. 446). In short, as Durkheim asked in his critique of pragmatism, "does progress not consist precisely of the obliteration of individual differences?" ([46], p. 432). When viewed in the context of diverse environments, however, the resulting "reality" is likewise diverse. "The original world survives under successive additions that enrich it. New realities are, in a sense, already present in the old one" ([46], p. 432). As with Morgan, the new institutions and practices differ from each other. "Nevertheless," Durkheim concludes, "these institutions fulfill the same functions as those that preceded them. The family, for instance, has evolved over the course of history, but it has always remained the family and has continued to fulfill the same functions" ([46], p. 433). For Durkheim and Morgan, logic (natural or "socially natural") serves as the

ordering principle that guides progress, provides norms of evaluation, and accounts for cultural diversity.

The structuralism of Lévy-Bruhl and Durkheim is echoed in the mid-twentieth-century structuralism of Jean Piaget and Claude Lévi-Strauss. For Piaget, "structure" is "a system of transformations" that produces a self-regulating whole. Transformations mark both change and continuity, linking the present character of the whole to its past. "Relative to concrete acts"—transformations carried out—"'natural logic' is a 'form,' one which can, in turn, be 'formalized'" ([47], p. 36). Wholes, Piaget argues, can be understood as group structures and, in this sense, can be analyzed in formal terms as constrained by two principles: "the condition that a 'return to the starting point' always be possible (via the 'inverse operation'); [and] the condition that the same 'goal' or 'terminus' be attainable by alternate routes and without the itinerary's affecting the point of arrival (associativity)" ([47], pp. 19–20). Self-regulation, then, is the "continual application of the three basic principles of rationalism: the principle of non-contradiction, which is incarnate in the reversibility of transformation; the principle of identity, which is guaranteed by the permanence of the identity element; and the principle, less frequently cited but just as fundamental, according to which the end result is independent of the route taken" ([47], p. 20).

Piaget explicitly recognizes in this context what he calls the "problem of natural logic": the relation of form to content. He argues that just as natural numbers involve a formal structure that can be abstracted away from the practices that generate an awareness of numbers (for example, matching numbers to objects), the "content" (the matching) already has structure ([47], pp. 28–29). Likewise, "the forms of what originally appeared to be 'pure content' in turn themselves have content, though less distinctly made out, a content with its own form, and so on, indefinitely, each element being 'content' relative to some prior element and 'form' for some posterior element" ([47], p. 29). On this account, natural logic, like natural numbers, is not only a structure of thought, but an ontological principle that provides a general account for the activities (that is, the ongoing transformations) of all wholes.

In *Structuralism*, Piaget argues that Lévi-Strauss offers a structuralist theory of "the primacy of social life" that is "intimately connected" to his own structuralist theory. Both, he suggests, draw on Durkheim's earlier work but emphasize (where Durkheim did not) that "Behind the 'concrete' social relations there is always 'conceptual structure,' unconscious, no doubt, and therefore discoverable only by elaborating abstract structural models, but nonetheless formative" ([47], p. 107). In *Structural Anthropology* Lévi-Strauss echoes the structuralism of Morgan: "If, as we believe to be the case, the unconscious activities of the mind consists in imposing forms upon content, and if these forms are fundamentally the same for all minds–ancient or modern, primitive or civilized…—it is necessary and sufficient to grasp the unconscious structure underlying each institution and each custom in order to obtain a principle of interpretation valid for other institutions and other customs" ([48], p. 21).

Lévi-Strauss illustrates his structuralism and the operation of something like natural logic in *The Savage Mind*. He proposes "two distinct modes of scientific

thought" to reflect the differences between the so-called "primitive" and "civilized" thought while preserving a common logic. "These are certainly not a function of different stages of development of the human mind," Lévi-Strauss writes, "but rather of two strategic levels at which nature is accessible to scientific enquiry: one roughly adapted to that of perception and the imagination: the other at a remove from it" ([49], p. 15). The former Lévi-Strauss calls the "science of the concrete." Piaget holds that this science of the concrete ought to be understood as a form of pre-logical thinking (and so would be comparable to the "pre-logical" in Baldwin's work) ([47], p. 116). Lévi-Strauss, however, claims that such thinking is logical but that it operates in the mode of a *bricoleur*, that is, it uses whatever resources are at hand to construct what is needed. One who operates at a remove from local perception and imagination, an "engineer" in contrast to a *bricoleur*, "questions the universe, while the '*bricoleur*' addresses himself to a collection of oddments left over from human endeavors, that is, only a subset of the culture" ([49], p. 19). The result is not a difference in stages, but a difference in the value of the method: "the engineer is always trying to make his way out of and go beyond the constraints imposed by a particular state of civilization while the 'bricoleur' by inclination or necessity always remains within them" ([49], p. 19). Both Morgan and Lévi-Strauss see logic as pervasive and underlying the development of diverse cultures. Morgan maintains the idea that logic is an engine for progressive development; Lévi-Strauss sets aside the evolution of culture, rejecting stages of development but affirming a cultural hierarchy based upon the values implicit in the underlying logic.[28]

In short, mid-twentieth-century structuralism continued the settler colonial implications identified with Morgan's earlier version of natural logic. Like Morgan, structuralism presumes ontological uniformity in the non-human world. The structures that frame human societies are uniform as they respond to environmental differences that are themselves elements of a single natural world. Second, both Morgan and the structuralists agree that human beings are all of the same type, they share a common origin and whatever differences they have are the product, again, of their diverse responses to environmental differences. Third, natural logic provides a normative frame for assessing human differences. Societies that operate as *bricoleurs* and those that operate as engineers do not have the same value. They are both human, both natural, but the former is limited and local, while the latter "always aims to go beyond the constraints imposed by a particular state of civilization." Fourth, the recognition and use of natural logic as a means of engaging human societies also make for epistemic and practical access to those societies, regardless of what those societies might say about being subject to such access. Taken together, despite its attempt to set aside the evolutionary approach of earlier theorists such as Morgan, structuralism echoes its predecessor's implications for settler colonization.

[28] Audra Simpson [50] sees a similar shift in the theory of Franz Boas in his *The Mind of Primitive Man* (1911) from Morgan's earlier stage theory. Boas, like Lévi-Strauss, sets aside the stage theory but maintains a human hierarchy in which indigenous peoples are "primitive" thanks to the value of their culture.

Post-structuralism sought to unseat structuralism from its dominant position in cultural studies by challenging the idea of fixed, formative structures that frame human meaning and action. Durkheim and his contemporaries argued that structures emerged in the development of human societies and determined how a society would respond to its environment. Where these structures were "natural" and potentially affected agents other than human, the later structuralists placed the framing structures in the operations of human societies and, in particular, in the structures of language.[29] Post-structuralists such as Derrida challenged the concept of deep linguistic structures by showing the instability of meaning and Foucault challenged the universality of social structures by considering the instability of human identities and the ways in which these structures reinforce their own power. Methodologically, post-structuralism provided a set of critical tools to challenge what was the dominant view, but its turn to language and rejection of metaphysical and moral foundations seemed to some to undermine efforts to positively address the problems that called for critical engagement in the first place. Gender-based oppression, racism, class-based oppression, and environmental destruction all seemed to call for both a set of critical tools and some method or set of principles to guide change.

Some theorists, post-structuralists in their critique of discourse, also have taken what has been called the "ontological turn" and proposed a starting point in new theories of human and non-human agency. These theories potentially provide resources for a new understanding of natural logic and for addressing settler colonialism. From the angle of this smaller set of post-structuralists, the new materialists, the critical project of Derrida, Foucault, and others, by focusing on discursive practices, fails to address the connections between human society and the wider world. As Karen Barad, one of the central theorists in this new movement,[30] asks, "If discursive practices constitute a productive social or cultural field, then how much of the very matter of bodies, both human and non-human, can be accounted for? Is the matter of things completely social in nature?" ([54], p. 64). "What is needed," she continues, "is a robust account of the materialization of all bodies—'human' and 'nonhuman'—including the agential contributions of all material forces (both 'social' and 'natural')" ([54], p. 66). As Thomas Reid once argued for the idea of agent causation (against a Newtonian materially deterministic universe),[31] the new materialists argue for a new form of agent causation and against confining agency to the special capacities of human beings and then undercutting the ability of agents to act against their circumstances. Karen Barad explains: "agency is about response-ability, about the possibilities of mutual response, which is not to deny, but to attend to power imbalances. Agency is about possibilities for worldly re-configurings. So

[29] A version of language-based structuralism also appeared in Anglo-American philosophy through the work of George Lakoff in his 1970 paper "Linguistics and Natural Logic" [66] which gave rise to a number of papers over the next several decades that considered the formal relation between natural logic and "natural language."

[30] This group of post-structuralist critics includes among others Karen Barad, Jane Bennett [51], Bruno Latour [52], and Rosi Braidotti [53].

[31] See Rowe [55].

agency is not something possessed by humans, or non-humans for that matter. It is an enactment. And it enlists, if you will, 'non-humans' as well as 'humans'" [56].

For the new materialists, agents are relationally emergent activities—"doings"—that constitute the world ([54], p. 178). Like William James's notion of consciousness as a kind of organized wave of energy moving through matter giving it form and direction,[32] agents are "intra-actions," actions that occur within a whole and are relationally framed by apparatuses: that is, structures that amount to affordances and constraints on action that make possible "a new way of thinking causality" ([56], p. 2012). The parallel natural logic of Barad's version of new materialism would be an account of the structure of agency and intra-action of the sort she herself develops using Niels Bohr's interpretation of quantum mechanics.[33] Matter, on this account, is not given but "matters" in its intra-actions with other matter and the processes of observation. Barad's theory of "agential realism" is grounded in the claim that the activities of matter are productive of matter and that the outcomes of particular intra-actions are indeterminate until those intra-actions are taken. Rather than being an account of how things are known, it is an "onto-epistemic" account of how knowing and being are mutually productive of the universe [56].

Despite the inclusivity of agential realism (and many of the other current agent ontologies), there remain worries about whether the operative "natural logic" of these views is sufficiently broad to account, not only for the reality of diverse non-human agents, but for a means of understanding their operations across differences. Vanessa Watts [41], for example, an indigenous sociologist, argues that new materialism, despite its willingness to include non-humans as agents in general, is not willing to include non-human agents in social relations that include, but are not limited to, humans. In this sense, new materialism, despite its aim to offer a more capacious view of agency, like its structuralist predecessors, ends up restricting all but the simplest agency to humans. This is a result, at least in part, of setting aside the "spiritual" or *purposive* aspects of agency that are apparent in many indigenous views of the world. Barad, for example, sets purpose in the ordinary sense aside from the theory of agency. Agency, she concludes, "is cut loose from its traditional humanist orbit. Agency is not aligned with human intentionality or subjectivity" ([54], p. 177) but rather with a thing's "iterative reconfiguring of the materiality of human … and other such forms" ([54], p. 178). Doing matters independently of the "reasons" for it. While Watts does not make the point this way, the discounting of the spiritual aspect of agency also leads to the discounting of non-humans of all sorts as agents with desire or purpose. Agents such as "dirt" (one of the examples considered by new materialist theorists) may be an agent in that its presence in the world acts on other agents, but most new materialist theories hold that such agency does not include its interest in participating in relations with others or its

[32] "We live, as it were, upon the front edge of an advancing wave-crest, and our sense of a determinate direction in falling forward is all we cover of the future of our path" ([57], p. 69).

[33] Barad's "natural logic" would be notably different from the one that underlies the structuralist tradition in that, for example, contradictions can be true. However, like structuralist logic, Barad avoids recognition of purpose as a real component of agency.

responsibility for the results of that participation ([41], pp. 28–30). The result is the reestablishment of a boundary that echoes the long-standing structures of natural logic. Watts concludes "The border where human-as-the-center begins still exists and continues to determine the bounds for capacity and action" ([41], p. 29). The willingness to discount purpose in the structure of agency replicates the settler colonial character of the natural logic that emerged with Morgan by likewise setting aside central differences in favor of ontological commonality and uniform channels of action.

2.5 A Decolonial Alternative

Despite changes in the view of natural logic, from Morgan through the new materialists, the four colonizing implications of Morgan's natural logic persist—and with them, the structures that support the ongoing oppressions of settler colonialism. As in Morgan's view, ontological uniformity is still provided by the structures of natural logic. Relativizing cultures to differences in language or methods of problem-solving leaves in place the expectation that cultural difference is not ontological, but rather a result of different circumstances in the very same world. The resulting ways of thinking ensure a unity of both species and origins that, in turn, provide for various structures of shared norms from the universality of logic and its practice as critical thinking to the requirements of human rights and the commitment to recognizing the centrality of autonomous individuals. Boundaries become discursive or political constructs that function in the same way that logical boundaries operate: that is, in terms of the principles of non-contradiction and the excluded middle. Boundaries are sharp, well-defined, and uncrossable as between nations, or they are not real boundaries at all, and are crossable. Cultural and linguistic boundaries have tended to be seen as epiphenomenal; political boundaries between states, races, genders, and so on, as well as the boundaries between autonomous individuals, on the other hand, are real, sharp, and demand enforcement.

In the end, what is colonizing about natural logic as it has developed in the West is its inability to engage realities and possibilities that are inconsistent. By assuming a logical framework that eliminates the legitimacy of inconsistency, the received natural logic rules out the possibility of there being genuinely incompatible worlds and points of cultural contact in which differences are not reducible to a singular set of rules or illative expectations. When people find themselves between cultures, their experience is one of living with true contradictions.[34] Such persons are seen as failing the standard of natural logic and so are encouraged (or forced) to adopt a view of the world that is not at odds with itself. The result of such pressure is inevitably either an unsustainable internal tension or a profound loss. In such situations,

[34] Pratt [58, 59], Chapter 1.

agency is always compromised by the inability to take as viable contradictory possibilities.

Decolonizing natural logic or the ordering structure that frames possibilities is to recognize that the colonial frame is a narrowing of possibilities to those that fit only a certain coherent form. Decolonial logic would recognize incompatible possibilities as real and so would affirm that contradictory claims may be true. At the same time, decolonial logic would recognize that, despite the truth of the incompatible alternatives as possibilities, taking action inevitably reduces the possibilities to the one taken. To act on one of a set of options requires that the set of incompatible options with which one might have lived must fall away. Sacrifice, then, is a necessary condition of action. Decolonial logic will recognize that people must both live with contradictions and with the necessity of sacrifice.

In this light, a decolonial logic will satisfy four conditions. First, it will be *modal* in its recognition of the structure of possibility and necessity. Second, it will be *dialetheic* in its affirmation that some contradictions are true. Third, a decolonial logic will be *paraconsistent* in that the principle of explosion (the deductive principle that allows any conclusion to follow from a true contradiction) will not hold. Finally, decolonial logic will be *ententional*, in that it will include the formal role of purposes or unrealized possibilities as causal in the processes of ordering and taking action. As a result, actions taken are also necessarily acts of sacrifice in that whatever action is taken, other possible actions will never be actualized and so are irrevocably lost.

A logic of agency that meets these conditions originated in the logical work of American philosopher Josiah Royce.[35] Taken up in light of indigenous conceptions of agency,[36] Royce's logic, which he called $\sum$, is a system of order grounded in the logical operation of exclusive disjunction (that is, where the proposition "A or not-A" is true) or, more accurately, it is based on a statement of possibilities such that the possibilities A and ¬A are both true of a situation in which an agent can act. An agent, in order to act, selects from the two (or more) incompatible possibilities and in doing so, irrevocably sets one line of action or set of possibilities aside and opens the other to new possibilities. The possibilities that are necessary in order that an agent be able to act are inconsistent (that is, are contradictory) *and* true, such that an agent has a real choice between them whenever the agent acts. Contradictions in $\sum$ are only ruled out in the context of actions taken. The principles of non-contradiction and excluded middle only hold for actions taken such that the other (contradictory) actions are consequently negated. Actions taken collapse the alternatives into an actual outcome (based on the action taken) and eliminated possibilities (that is, the outcomes that would have followed had the other action been taken).

Agency is not, however, acting through coercion or by chance; it is, to use a term proposed by Terrance Deacon, "ententional." Agency requires that the agent choose in light of some purpose and some bounded range of possibilities. Agency, in this

[35] See Royce, *The Principles of Logic* [60], Pratt [61, 62].

[36] See Pratt [34].

sense, is not just the ability to act but the ability to act with a purpose. These possibilities or future states are what Deacon [63] has called "absential phenomenon," that is, "the paradoxical property of existing with respect to something missing, separate, and possibly non-existent …phenomena whose existence is determined with respect to an essential absence" ([63], p. 3). While natural logic, in its received form, involves an agent and processes of illation framed by non-contradiction, excluded middle, and identity, this alternative natural logic involves an agent, two or more incompatible courses of action, and an organizing purpose or entention.

While Morgan's natural logic has four colonizing implications that also make it an instrument of settler colonialism, $\sum$, as an alternative natural logic, does not share these implications and consequently is a candidate for a decolonial logic. Unlike Morgan's natural logic, $\sum$ does not require ontological uniformity. In the way of most modal logics, $\sum$ supposes plural worlds (without regard to what "kind" of worlds they are). Rather than reducing the experience of different worlds (cultural or otherwise) to a single world, $\sum$ can affirm dramatically different worlds of varied access and connections despite a common logic or system of order. Since past actions are inaccessible (that is, actions are not reversible), $\sum$ requires that unity, when it occurs, occurs only in the outcome of action. Origin stories, shared languages, and cultural forms are operative in the ordering process, but they are operative so as to realize possibilities, not to realize some unity in the past. $\sum$ also implies norms, just as Morgan's natural logic does. However, $\sum$ does so without establishing the norm of consistency. As a result, where natural logic establishes the expectation that rational thought rejects contradiction and that thinkers who accept them are "primitive" by definition, $\sum$ *requires* inconsistency in the present moment so that agents can act. From the perspective of $\sum$, the demand for consistency amounts to the demand that agency cease in favor of a static system of actions, beliefs, and values that are all compatible with each other.

Finally, where Morgan's natural logic expects epistemic and practical access across cultural and other differences, $\sum$ expects only limited access. Bridging differences (that is, going beyond exclusive disjunctions that mark boundaries) requires the generation of a third term, a future state or purpose in terms of which the present inconsistency of a boundary can find a common orientation. Shared purposes constitute the point of contact for joint or collective action but do not require that the divergent courses of action unify except in relation to the issue at hand. The result is that access across differences is possible but only happens locally around the possible shared purpose, not universally where the two sides can be reduced to a single whole. While Morgan's natural logic as common sense or critical thinking requires that users seek consistency of actions, beliefs, expectations, and world, $\sum$ places agents in the midst of inconsistency where beliefs, expectations, and worlds include contradictions that cannot be resolved in terms of the situation from which they emerge. It is only in action that contradictions collapse such that a new line of possibilities is actualized, even as another line is lost forever.

Significantly, Morgan's natural logic and its successor theories turn out to be subsystems of the larger system Σ. In these natural logics, the actions of agents are overdetermined by the narrowing of worlds to one, to the demand for consistency of

beliefs and truth claims, the use of *reductio* arguments that rely on the principle of explosion, and the exclusion of purposes as making a formal difference in inference. The inconsistencies necessary for action still occur but the possibilities excluded are overlooked or seen as possibilities destined to be left behind. The necessary organizing purposes are present as well, often captured by the idea that the judgments that direct action are “neutral” or “objective” and so obscure the fact that they are nevertheless organizing purposes. Such natural logic works because it can operate within the larger system. That it has worked, however, has been central to the rise of settler colonialism and other systems of racial, gender-based, and economic oppression. To resist such systems, it is necessary to take up a wider logical perspective. Settler colonialism is predicated on the quest for land *and* the presence of boundaries, frontiers, and borders that give meaning to the quest; natural logic provides a structure that supports *both* the elimination of difference and the reification of boundaries. The lesson of boundaries from the perspective of a decolonized natural logic is this: boundaries are zones of contradictory possibilities where particular acts collapse possibilities into single courses of action without necessarily collapsing the boundary. A decolonized natural logic provides a wider frame with which to reveal and challenge oppressive systems. The natural logic received from the western philosophical and social theoretical traditions invisibly but inevitably contributes to forms of oppression—and is doing so even now. Without a wider logical framework, critical challenges to systems of domination risk relying on the principles of colonial natural logic and re-inscribing the very structures they seek to replace. The study of the history of logic on the one hand and of alternative logics on the other can thus be seen as a key part of any twenty-first-century effort to resist the ongoing consequences of the world’s long history of colonization.

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Chapter 3
Natural Logic, Anthropological Antilogies, and Savage Thought in the Nineteenth Century

Claude Blanckaert

Abstract The overtly naturalist perspective of nineteenth-century anthropologists led them to regard the basic functions of thought—analysis and synthesis, abstraction and generalisation, induction and deduction—as the same in all animals and humans. As a reflection of objective reality, the logical law governing the moral and material world was universal and constant. So intellectual capacities and "perfectibility" varied only in quantitative terms, according to organic development—itself proportionate to greater or lesser brain size—or to the supposed adaptation of responses to solicitations from the environment. The dynamic movement of civilisation was seen to reflect this guiding faculty of thought through which the species *Homo sapiens* escapes its animal envelope. The inertia of "savage" peoples, their versatility and other psychological traits incompatible with the mastery of nature through reason seemed to deepen the great divide between the so-called "progressive" races and others that were stationary, "regressive" or atavistic, always in deficit, caught in a tight circle of ideas and who were, consequently, commonly assimilated to recalcitrant monkeys and children. Their contrasting and indeed opposing destinies were codified in the concept of the "law of opposites". This gave rise to learned rationalisations proposing that animals and all "inferior" races were struck at puberty by a reversal of initial potential that did not affect "progressive" westerners. Particularly since this "regressive metamorphosis"—discussed in France throughout the nineteenth century—contradicted "natural logic".

Keywords Anthropology · Natural logic · Animals · Savage mind · Development · Race · Evolution · Children · Intelligence · Psychology

Mathematics Subject Classification Primary 00A– Secondary 03-03 - 03A – 03B

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3.1 Introduction

The overtly naturalist perspective of French anthropologists of the nineteenth century led them to regard the basic functions of thought—analysis, ideation, causal inference and the ability to abstract and classify—as the same in all humans and animals. As a reflection of objective reality in living beings, the "logical law" governing the moral and material world was universal, univocal and also necessary, since it coincided with the adaptation imperatives of life until increasing organisation led to the emergence of conscious thought and introspection. For Clémence Royer, a philosopher known as the first translator of Darwin's *Origins of Species*, it is "a kind of chain mechanism that inevitably unfolds once it is set in motion by a present, preserved or renewed sensation" [1, p. 282]. Human beings can be no exception to this rule of action. The dominant classical discourse of the soul and its fixed categories thus gives way to an examination of the determinants or psychic mechanisms common to animals. In humans these are more complex, but not contradicted and, as Jean-Baptiste Bory de Saint-Vincent noted in the 1820s, "the true sage leaves us where nature deigns to place us" [2, t. 2, p. 216].

The rule suffers neither derogation nor contradiction. Everything in nature is successive and creation rises from the simple to the composite. Consequently, when Man appeared, according to the naturalist Jacques-Bernard Hombron, "he constituted the *intellectual series*. This also developed progressively, because progression is logical" [3, p. 55]. The naturalisation of understanding and its mechanisms then continues, or rather completes the "psychologisation of logic" begun by the empiricists with John Locke (cf. [4, p. 325 and ff.]). However, unlike the Enlightenment philosophers, for whom the culture of the mind was externally derived, the specialists of the so-called positive century convinced themselves that the "higher modes" of mental activity were governed first and foremost by cumulative inheritance and, explicitly, that "psychological life, in its highest form, is subject to this biological law", as contended by the professor of the Collège de France Théodule Ribot. As a consequence, inequalities of aptitude between individuals and, more still, between ethnic groups were a matter of nature, of the "right of the innate", far more than of learning. Hence the axiom, little contested throughout this long period, that "all travellers compare inferior races to children, due to the violence and volatility of their desires and the weakness of their reason. Humanity was able to leave this state only gradually". To do so requires a well-prepared brain and an appropriate "terrain". In this light, the "savage" in his natural state, being a "contemporary primitive" and thus anachronistic, seems stuck at the lowest level of the "embryology of the mind" with "a mind full of images and empty of ideas" [5, p. 65, 299, 287 and 414].

3.2 The Psychic Unity of the Living World

The anthropologists were little given to philosophical "speculations" and had a low opinion of the Cartesian dualism of consciousness and substance, the allegory of the "thinking reed", Condillac's statue that listens to itself thinking [1, pp. 262–263] and, worse still, the theology of free will, which they often described as a "Gothic citadel". This was not simply a reflection of systematism or materialism. The *natural logic* thus promoted was linked to a functionalist secularisation of values. The nineteenth century's ambition was either to abolish [6, p. 54] Aristotle's qualitative ranking of souls, as the naturalist Georges Pouchet put it, or to convert it into nature, as formulated by Clémence Royer (cf. [1, p. 57]). It thus proceeded from a critique of automatism in animals, including in its modern opposition of instinct to intelligence, and from a corresponding shared assertion that men are not distinguished from animals by their mental operations, other than in terms of degree. Intellectual capacities and "perfectibility" vary only in quantitative terms, either according to organic development, which in mammals is proportionate to greater or lesser brain size, or to the supposed harmony of responses to solicitations from the environment.

The result is that traditional dualities blur, and are indeed worn down. On the one hand, human activity is partially a matter of reflex. Man has instincts, while animals feel, judge and want. They reason, and their intelligence, though more limited, "is still of the *same nature* as that of man", according to Armand de Quatrefages, professor of Anthropology at the Muséum national d'histoire naturelle in 1877 [7, p. 10]. Royer encapsulates all the issues in the debate in her evolutionist style: from oysters to men, she explains, intelligence remains the same because it is quintessentially "the measure of the objectivity of the real relationships between things and beings" [1, pp. 55–56]. However, it is more or less autonomous or heteronormed by external circumstances. The intensity or connective power of understanding is thus bound to vary in context according to the pattern of the needs-based passions that set it in motion. This pattern produces marked differences between different species, and even between small groups and individuals. Whatever may drive intelligence, however, it is born of the concrete needs and sensations that stimulate it. For the rest—in other words the most important—Royer states, "analysis and synthesis, abstraction and generalisation, induction and deduction thus always existed, but in a shrouded state in animal intelligence" [1, pp. 260–261].

There is doubtless a long way from pure potentiality to active power [1, p. 58]. Evolution plays a part. All the same, the principle becomes established and remains so throughout the century: "when an animal thinks, and to the extent that it thinks, it thinks like us" [1, pp. 280–281]. The most spiritualist authors agree. According to the naturalist Henry Hollard, there is parity or parallel between goals and means, and abstraction is not the preserve of man:

> Capable of remembering and consequently of experience, animals are able to associate a memory with a current perception. They grasp the relationship of dependency between two facts that they have seen follow one on the other. They go still further: at a first level of generalisation, they raise identical facts to the level of analogue facts, and an accidental

> case tells them about the general case. Then they imagine; they combine means with an aim; they act for a reason. [8, pp. 51–52]

The discovery of the "psychic unity" of the living world revealed trends. The principle of universality enriched moral anthropology, just as comparativism had previously shown the gradation of physical organisations. Jean-Baptiste Bory de Saint-Vincent notes, "It is in a Baconian spirit that we must study intellectual Man, who is merely a consequence of mammalian Man. Any metaphysics that does not have anatomy and physiology as its guiding lights is not worthy of the name science" [2, t. 2, p. 217]. Anthropology swept entities aside. According to Paul Topinard in 1885, by then secretary of the Société d'Anthropologie de Paris, man must now be regarded "in the crucible of reality" [9, p. 2], or, as Georges Pouchet put it, as a "fraction of the organic series" [6, p. 37]. According to Hombron and Pouchet, the "mysteries of the soul" of Christian traditionalism must be replaced in every case by an entirely new science, sometimes called "comparative psychology" [3, p. 351]; [6, p. 36 and Chap. 2] and sometimes, following Royer, the "comparative anatomy of the mind" [1, p. 53] or with Ernst Haeckel "phyletic psychogeny" [10, Chap. 9].

The soul is then identified with intelligence, which is in turn identified with the logical capacity to generate ideas and establish a relationship between them. Through anthropocentric projection, animals are clearly perceived as an early prototype of humanity. They think like us—or rather, like children who develop in stages. By the same token, according to Charles-Auguste Coudereau, "before becoming a man, a child is an animal" [11, p. 37]. In the early nineteenth century the anthropologist Julien-Joseph Virey wrote that we are born monkeys, so to speak. Strangely, intelligence is never defined or apprehended in its operational modalities, its organising principles for judgement and action. At most, the naturalists tell us, it is commensurate, but not equivalent, in all species, whether inferior or superior. From diatoms to Pascal, argues in 1881 Gustave Le Bon, scientific writer and traveller, a member of the Parisian Societies of Anthropology and Geography, "the intelligence of all beings is composed of similar elements, differently grouped", with no "clear separation" or "gulf" [12, t. 1, pp. 468–470]. It is distributed in a regular, graduated, almost quantitative manner and its movement is centrifugal. Consequently, the irreducible variety of animal and human behaviours is not considered in itself; instead the authors emphasise the arrangement of elements and their energy or goal. Intelligence seems spontaneously complex. It is a combinatory faculty that involves attention, lucidity, reason and the scales of judgement, in different doses [13, p. 289].

Although favoured, adds Topinard, Man "is not a being apart in creation" and his differences are a matter of degrees of evolution in a single direction [13, pp. 24–25]. He has the same needs as animals and "the same ways of satisfying them" [13, p. 22]. So it is pointless to say that Man's basic actions reflect his status as free agent or that the soul guarantees the unity of the mind. The serial perspective annuls or diminishes any metaphysical description, whether founded on thought, technical skill, communication or the "species perfectibility" much vaunted by the eighteenth century, after Buffon, to measure advances and integration in human societies (cf. [14]).

3.3 Rough Drafts of Humanity

The capacity for progress seems to be conditional and associated with the so-called superior races, and is even seen as a differential instinct unknown to most exotic nations. In 1865, the physician Eugène Dally gives us a lesson in scepticism: "On the one hand, I deny that all men are perfectible and that it is thus a characteristic of the species, and on the other hand I deny that all animals are not" [15, p. 652]. While psychology might justify the exceptional nature of humanity by evoking the development of more abstract notions of space, time, causality and the cause of causes, as contended by Hollard [8, p. 77 and ff.] as the crowning achievement of experience, it is easy to reply, says Paul Topinard, that genius is rare or that most men are as simple minded at the age of fifty as they were at ten [13, pp. 290–291]. According to Clémence Royer, only a tiny fraction will rise to the apperception of the self as separate from the non-self, etc. [1, p. 268]. Also, as La Mettrie had written long before, the transition from animal to man is not sudden. For Georges Pouchet this boundary or symbolic barrier is necessarily beyond our grasp, "we see only a continuum without pause or sharp demarcation" [6, p. 44]. So, even before Darwinism, on his lower borders Man rubbed shoulders with the animals. In the light of the extension of natural logic to all, claims of a hierarchy of species, races and individuals produced both hasty solutions and riddles. Resuming a little-contested stereotype, Louis Delasiauve confesses his perplexity to the members of the Société d'Anthropologie de Paris in 1865: "We can clearly see that which broadly distinguishes man from animals. When, passing from intuition to scientific assessment, we seek to establish the differential characteristics, our predicament is inextricable" [16, p. 671].

The result is a paradox: Man the gifted primate evades investigation. He retains his classically defined attributes and prerogatives, which go unchallenged, but cannot come to terms with them. And, contrary to all expectations, naturalist anthropology did not develop any specific ideas concerning the logical identity proper to human beings. While, according to Paul Broca, founder and main spokesman of the French School of Anthropology, "above the unthinking instincts that play such a large role in our existence", animals "possess real intelligence like us, in every way comparable to our own", mobile and unrestrained [17, p. 668], there is also, according to Paul Simonot, a "decreasing progression" of stupid beings without imagination, who vegetate without creating and to whom we yet "cannot refuse the quality of human" [18, pp. 647–648].

In the nineteenth-century polygenist tradition, man is human to a greater or lesser extent. Across the world "noble" races are observed alongside others of little consequence—naturally inferior, "ignoble" races, as the anatomist Pierre Gratiolet put it [19, p. 286 and 327]; cf. [20]. They do not all share the same aptitudes. In other words, white man may sometimes be stupid, but the savage is quintessentially stupid. In practice, after the second Enlightenment the non-value of savages was not a matter of ethnocentrist prejudice so much as a kind of natural description. Most writers spoke of the "dull genius" of the Americans and during the 1810s,

Julien-Joseph Virey, at this time military chemist and scientific editor, explained that "Negroes", with their "entirely animal" lives that disposed them to "voluptuous sensuality", seemed better made "for eating than thinking" [21, p. 261]; [22, p. 426]. Fifty years later it became commonplace to compare the Aboriginals of Australia to kangaroos and to state in generic terms that the savage, wherever he is, is "barely equal and perhaps inferior to some of our domestic animals", as expressed by Clémence Royer [1, p. 543]! Heredity, instinct and the force of bodily impulses combine to crush talent. This approach was sanctioned by the physiologist William Edwards, by then (1829) an authority and founder of the first Société Ethnologique in Paris, for whom the savage, incapable of civilisation, "owns nothing, knows nothing and is good for nothing" [23, p. 28]. Even the rationality attributed to monkeys appears scarcely attributable to the lowest of men, such as Hottentots, Papuans or the inhabitants of Tierra del Fuego. Consequently, the perimeters of the human are necessarily beyond the grasp of our savant surveyors: "So, while the mental superiority of some human varieties over brutes seems to authorise us to make a distinct class for Man, a human realm, the difficulty is that of tracing its lower boundaries" [1, p. 543]. To put it another way, should we include dogs and horses?

The capacity for advancement did not discriminate, however. The question of the structures of thought long remained open, or undecidable. Was logic linked to an innate symbolic brain endowed with laws of operation independent of race? Did it depend on society, in other words on education and history, or on a system of organic needs common to animals at every level and variable only in terms of weighting? Every solution had its partisans. There was a consensus around two main ideas but the anthropologists did not conciliated them easily.

1. Firstly, as often noted by travellers, young "savages" raised in the European style showed dispositions for intellectual learning of all kinds. The seeds of the best qualities were present in them and nothing seemed sufficiently finished or predetermined in individuals of different races to prevent the rights of an African being promoted over those of the "four-fifths of Frenchmen who pass for the most intelligent people in the world". Even before the abolition of slavery was put on the political agenda, Bory de Saint-Vincent radicalised this ironic idea using the example of Haiti: "In a single island of the Antilles we see some of these men, reputed to be inferior in intellect, giving more proof of reason than exists in the whole of the Iberian peninsula and Italy put together" [2, t. 2, pp. 62–63]. Should these exemplary cases be put in the balance and groups be divided, or regarded as "masses of men", as advocated by Edwards and Gobineau [24, pp. 181–182] followed by Paul Broca?
2. On the other hand, the image of the contemporary primitive, the "disciple of nature" praised in the eighteenth century for his authentic ways, had clearly evolved in the direction of privation or deficit [25, p. 223 and ff.]. In a contrast fuelled by the civilised norm, "savages" (according to the concept of the time) lived in a perpetual present. Indeed, they were an illustration of extreme alienation and were lowered to the rank of animal. There was talk of fallen races affected by "irremediable vice", according to Alphonse Esquiros "dead to civili-

sation" [26, p. 172] and, as Jacques-Bernard Hombron put it in terms of incompleteness, of "rough drafts of humanity" [3, p. 205]. They were an exhaustion of the ideal, rational, conquering Man. The linguist André Lefèvre affirmed this reification into segmented human types after 1890, describing the black people of Africa as "shrunken gorillas". According to him African Negroes had a "short" memory and "almost no" capacity for foresight. He went on to say that, despite their ingenious mythologies, everywhere "dulled intellect lies in the same immemorial stagnation" [27, p. 111]. I want to emphasise how this frozen rhetoric reveals the weakness of these rationalisations, rather than just a trivial, ever-present, ambient racism.

Savage thought found no interpreters in the French anthropological community. Some ethnographic descriptions retained the picturesque approach of old-style travel journals, in which native logics were indexed to classical characterology, temperaments and the spirit of places and climates and where explanation was replaced by anecdotes; in others, conversely, generalisation led to considerations of potential and collective intelligence. The investigations of ethnic psychology followed a pre-established questionnaire. Men were to be assessed in relation to different categories: general and particular sensitivities, affects, interaction with the world, depth of memory, imagination, attention span, curiosity, expression of abstract ideas, numeration and notions of time and space. Ultimately, however, the rational impoverishment of savages appears patent and, as evidence of their dullness, it is enough to mention the "undoubted fact" that, in acquaintance with a well-known thesis of the evolutionist John Lubbock, they "are unable to count their own fingers, even of one hand" [28, p. 293]; cf. [29] or that, for them, sharpness of the senses "serves only to disadvantage the thinking faculties", as Arthur de Gobineau put it [24, p. 183, note]. Similar in this to anthropomorphic apes, they represent a living prehistory, "incomplete forms, unsuited to any further evolution" [30, p. 79]. In sum, they are fossils eternally surviving on an earth that is no longer made for them. In 1881, cataloguing the forms of insanities that are described in some studies of "savages", Gustave Le Bon declared them to be incapable of distinguishing truth from falsehood, superstitious, and "very emotionable", imitative and carefree in a manner "comparable to that of the ox that calmly grazes on the path along which it is led to the abattoir" [12, t. 1, livre IV, Chap. 1; cit. p. 335].

Of course, as progress demanded, civilised nations had also had their "barbaric" age. But their development reciprocally constituted the backwardness of the others and it was by the mental distance between them that the heterochronies of a single historical process could be measured. The century's resulting riddle, posed by Charles Darwin in the late edition of the *Origin of Species* (1872), was to understand "why, of two races of savages, one has risen higher in the scale of civilisation than the other?" [31, p. 181] Darwin invokes "increased brain power". His equation is subtle. For even supposing the advance of encephalisation unlocks intelligence, the *energy* of the organs takes precedence over their volume. This observation was made by many anthropologists. Skull volumes and brain weights may reflect average tendencies, but it remains the case that other dynamic factors are more

important in relation to mental disparities. In particular, "intrinsic qualities" and connections between brain cells vary to such a degree between individuals that, as Paul Topinard accepts in 1900, within a species "we could establish a scale from zero to a thousand, I suppose. How great the difference between the early races that have disappeared and the superior races of today and, among the latter, between some men who think and act in an entirely vegetative manner and our nineteenth century thinkers!" [13, p. 23].

3.4 The Law of Opposites

Whatever we may think today of the naturalists' fascination with the morphology of heads, established through measurement, the importance of *dynamic* anthropology increased throughout the century. From this perspective, psychic economy depends less on simple matter than on preponderant needs, themselves activated by the relative vitality of the race. From the physical, moral and intellectual point of view, savage ideas are not incoherent. It is simply that, as Charles Letourneau puts it, in the mental life of inferior Man, primary needs, notably for food, come to "dominate, roar and stifle all others" [32, p. 595 and ff.]. Primitive Man is thus a "kind of wild beast". The philologist Ernest Renan also regarded him as incapable of abstraction, given the great distance between the intuition of a given reality and an analytic idea of things [33, p. 31]. But this does not mean that primitive Man lacks everything that makes Man what he is. Letourneau clearly states that, "In even the most stupid savage there is intelligence". Reciprocally, civilised Man can sublimate instinct without it losing its imperative. What changes from one to the other is the adverse power and variable balance of energies. The budget of forces remains the same, but they are "differently subordinated" in different races and determine the changing psychological priorities of the "ages of humanity", sometimes for food, sometimes of an emotional or truly intellectual nature [32, p. 597].

The psychogenetic approach borrows its guiding concepts from the "development" model of 1830s embryology, including the cardinal role of time, the differential progress of epigenesis from simplicity to complexity, the "halt" or "excess" of evolution and the slowness or, conversely, acceleration of a movement prescribed by the fundamental orientations of the species. It sheds singular light on the hierarchy of races. The European world is embodied in history. Only the favoured races said to be "superior" go through the full cycle of psychic metamorphoses, even if "the incomplete state of intelligence" among the majority of their representatives is often noted [1, p. 268]. The others—all of them—show a backwardness proportional to the distance not covered. They are thus diversely under-developed, even out-dated, indicating an aborted potential, some kind of failure or contrast in their accomplishments. All have a common origin, but the most energetic races evolve in parallel to the less well endowed, which they replace or leave by the wayside.

The history of civilisation is defined by the gradual disappearance "of this savagery, this barbarity that we find at the base of even the most intelligent races", as

Alfred Maury, general secretary of the Société de Géographie de Paris, puts it in 1857 [34, p. 550]. However, in itself this is not enough. In Hegelian vein, the spirit of civilisation seems to pass from one people to the next, and to sterilise each in turn: the Egyptians preceded the Greeks, the Chinese world advanced rapidly before sinking into stupor, the ancient Peruvians have left only ruins behind, and so on. The precedence of a civilisation is thus no proof of an absolute superiority of intelligence [35, p. 311]. The organic metaphor gives another face to this virtual perfectibility. According to the physician Gaëtan Delaunay, "inferior" beings emerge early, develop rapidly and quickly suffer arrested development followed by decline. Conversely, "superior" beings emerge later, mature their aptitudes slowly and continue indefinitely [36]. So it is important to gauge the norm of progress by the outcome of the process rather than by the early emergence of thought.

The development model offers an understanding of human cerebrality and ethnic psychology based on progress through time. Its description adopts the analogy of the trajectory of the individual, who begins as a foetus and passes through the juvenile stage before achieving adulthood. Leaving animals aside, savages are like children who have not grown up. They have retained the childlike character traits of versatility, a tendency to imitate, selfishness and blinkered judgement. The notion of "child peoples" was widespread from the Enlightenment onward. On his return from an expedition to South America in 1745, Charles-Marie de La Condamine belittled the native peoples of Brazil who "grow old without ever leaving childhood, retaining all its failings": "they spend their lives without thinking" [37, p. 62]. It became possible subsequently to conclude, in a facile chiasmus, that the childhood of logic merges with the logic of childhood. This is a representation of lack that is normal in the consciousness of infants, but clearly retarded in the case of the contemporary primitive. Observation shows them as comparable in the sense that, through phyletic recapitulation, children pass through the successive stages of the mental hierarchy of their ancestors in abridged form, while the primitive is immobilised or downgraded to the earliest times. The primitive resists movement; he is a "true child", according to Abel Hovelacque, professor of Linguistics at the Ecole d'Anthropologie de Paris (1881, [38, p. 304]) in an adult's body. This is a harsh verdict, since children are known to obey no "logic" other than the "most simple; they use only concrete facts, observations of concomitance, succession, antecedence and crude analogy, without even trying to grasp the distant cause of phenomena". They do have the capacity for abstraction, but only "in a most inferior way", as seen among the "higher animals", as emphasised by the professor of Sociology in the same school Charles Letourneau in 1901 [39, p. 39]. However, although savages are always assimilated to children, there remains a great difference between them, since the savage's interaction with the world ends where that of the child begins.

It is hardly surprising that their destinies diverge. The reversal of progress involved in this thwarted development proved so disabling that anthropologists insisted on the "duality of the human species", using it to underpin a law of so-called recurrent metamorphosis or law of opposites [40]. This notably stipulates that the widely recognised educability of young savages ends with puberty. At that point individuals of the "inferior" races are subject to a "crisis" of growth, which

similarly affects most tame animals, and notably the great apes. Under the now preponderant influence of the "savage instinct", they throw off the ties of civilisation. In other words, the sterile advantages that they have in childhood do not in any way counteract a future determined in the entire race by the inevitable strictures of biological inheritance. Such was the view of Armand de Quatrefages conveyed to the members of the Société d'Anthropologie de Paris during a meeting in 1872:

> Among mammals, such as donkeys, foxes and some dogs, do we not clearly see a manifest regression in the adult compared to the young individual? Is it not the same again among the monkeys? And is this crisis so generally manifested, which leads first to a halt and then to a reversal in the individual who has reached a full state of development, not also encountered in the inferior races of humanity? The young negro is almost equal to white children. Many conclusive facts have been gathered in the United States in this regard, and yet what a difference is shown later by the negro in comparison to the white adult. So there is a general phenomenon here.

Native logics are subject to this dichotomous schema, which structures all value-judgements and factual judgements in relation to otherness.

3.5 Conclusion

Such are the limitations of exclusive polarities. If reasoning must be conducted in disjunctive terms (superior/inferior, active/passive, forwardness/backwardness, sociability/anarchy, etc.), the West is clearly operating in truth, the savage in error. It only remains to decide, according to Auguste Comte, whether the civilised have acquired "a greater natural aptitude for the combinations of the mind" [41, p. 137] through practice and development or whether, in a more radical alternative, put forward by the physician Gustave Lietard, savagery is a "way of being," a "form" in itself, with no assimilation or reduction possible to one of the supposed stages of global evolution [42]. Ultimately French anthropology was caught in a double bind. Believing, with the philosophical tradition, that there is no middle ground between thinking and not thinking, it extended the concept of "natural logic" to the whole animal kingdom. Simultaneously lacking any way of grasping the validity specific to the logics of indigenous peoples, it confined itself to strengthening its own categories and deepening the gulf between the so-called "progressive" races and others that were stationary, "regressive" or atavistic.

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Chapter 4
Referring to Logical Skills to Assess the Rationality of an Ethnic Group: The Zande Case in the History of the Social Sciences

Claude Rosental

Abstract To what extent have social scientists referred to logical skills to assess the rationality of peoples since the beginning of the twentieth century? And what has "logic" meant for them? In order to start addressing these issues, this study examines a famous and heated debate among social scientists on the rationality and logical skills of an ethnic group of North Central Africa—the Azande. Although logic as a scientific discipline has undergone major changes in terms of objects and approaches throughout the twentieth century, many social scientists relied on views on logic dating back to Antiquity or which are rather elementary to assess the Azande's behaviors and reasonings. Their diverging representations of logic led them to formulate conflicting claims regarding the logical skills and rationality of this ethnic group. This study also shows that despite the diversity of their assessments, they proved to be reluctant to people the world with irrational minds on the basis of their views on logic.

Keywords Logic · Rationality · Primitive mentality · Assessment · Coherence · Contradiction · Azande · Evans-Pritchard

Mathematics Subject Classification Primary 00A– Secondary 03-03 - 03A – 03B

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4.1 Introduction

To what extent have social scientists referred to logical skills to assess the peoples' rationality since the beginning of the twentieth century? What has "logic" meant for them? How did these meanings impact their assessment?

In order to address these issues, I will study more particularly how social scientists have assessed the Azande's rationality. The Azande[1] are an ethnic group of North Central Africa.[2] The assessment of their rationality generated a well-known, heated debate among social scientists that has raged for almost a century. The contributions to this debate have supplied an ideal corpus to set off addressing the issues I have raised.

I would like to show that many participants in the debate relied on basic or ancient views on logic, while logic as a scientific discipline has undergone major changes in terms of objects and approaches throughout the last century. Their diverging representations of logic led them to assess the Azande's behaviors and reasonings differently. At the same time, they proved to be reluctant to people the world with irrational minds on the basis of their views on logic.

First, I will briefly analyze a set of representations of logic that participants in the debate mobilized in their writings. I will then focus on how Evans-Pritchard, Peter Winch, and David Bloor discussed the issue of the Azande's rationality, depending on what logic meant for them. I will show in particular how Evans-Pritchard opposes Lévy-Bruhl's theory of primitive mentality in this respect.

4.2 Social Scientists' Views on Logic

The views that participants in the debate have on logic tend to portray this discipline as a static field of knowledge. Several authors refer to representations of logic close to those developed from the Antiquity till the end of the nineteenth century. In particular, ancient syllogisms appear to have been perceived as central, stable, or even immutable logical objects. This view stands in stark contrast with the radical changes of approaches that logic as a discipline has undergone over the past century.

In some writings, "logic" appears to refer to a single and all-encompassing theory, although logicist approaches were abandoned at the beginning of the 1930s. Besides, some authors seem to equate logic with a few principles like the principle of contradiction. Other authors adopt propositionalist views on logic. In these views, logic is equated with a calculus on propositions. Still, other authors develop an inferentialist representation of logic. In this framework, logic consists in warranting valid inferences within the realm of discourse.

[1] Plural of "Zande" in the Zande language.

[2] The Azande live primarily in the northeastern part of Congo, in south-central and southwestern part of Sudan, and in southeastern Central African Republic.

For many social scientists, logic seems to rely on a limited set of notions including: logical "laws" or "rules," inference, deduction, logical necessity, logical structure, and formal reasoning. In the writings that convey these terms, definitions of the latter are often vague or missing. It is then difficult to identify their precise meaning. Sometimes, these terms appear to have several meanings in the very same text. Fluctuations in the meaning may be observed from one paragraph to the other. This is particularly true for the notion of "formal reasoning." Anyhow, some writings do not fit these descriptions. They convey quite sophisticated and precise views on logic.

Furthermore, authors have diverse views on the nature of logic. According to some of them, logic is part of the psychology of reasoning. According to others, the matter of logic is language and logic may be likened to principles that govern how statements may be articulated. For other social scientists still, logic is synonymous with abstract and inescapable principles of reasoning.

In order to go beyond this initial overview, it is now interesting to thoroughly study the views and uses of logic in selected writings. For this purpose, I will start with Evans-Pritchard's *Witchcraft, Oracles and Magic Among the Azande* [1].

4.3 Equating "Being Logical" with "Being Coherent"

In this book devoted to the study of Zande culture first published in 1937, Evans-Pritchard uses a quite loose view on logic. Logic refers essentially to a notion of coherence. Being logical means endorsing coherent ways of thinking and acting [1, p. 159]. As for the notion of coherence, it refers principally to the absence of contradiction [1, p. 159]. However, Evans-Pritchard does not invoke the existence of some principle of contradiction, nor of some logical principle. In the introduction of his book, he merely and briefly evokes logical rules on which science is supposed to be based.

This view on logic allows Evans-Pritchard to consider that the Azande think logically [1, p. 30]. Indeed, the ways they think appear fully coherent to him:

> Their mystical notions are eminently coherent, being interrelated by a network of logical ties, and are so ordered that they never too crudely contradict sensory experience but, instead, experience seems to justify them … Zande behaviour, though ritual, is consistent, and the reasons they give for their behaviour, though mystical, are intellectually coherent. [1, p. 150, 159]

This assessment is based on the fact that Evans-Pritchard identifies no contradiction in Zande reasonings. Such an assessment may seem puzzling since the Zande views on witchcraft may well appear paradoxical at first sight. Indeed, as Bloor summarizes it:

> Being a witch [amongst the Azande] is … an inherited physical trait, consisting of a substance in the belly called witchcraft-substance. A male witch will transmit witchcraft-substance to all his sons and a female witch to all her daughters. This substance can be detected in post-mortem examinations and these are sometimes undertaken to establish or

> refute witchcraft accusations. It would seem a clear logical inference that only one, single, decisive and incontestable case of witchcraft is needed to establish that a whole line of people have been or will be witches. Equally a decision that a man is not a witch should clear all his kinsmen. The Azande, however, do not act in accordance with these inferences … In practice only close paternal kinsmen of a known witch are also considered witches. [2, pp. 123–124]

According to Bloor [2, p. 124], "Evans-Pritchard … explains what's happening by considering the degree to which the Azande give priority to specific and concrete instances of witchcraft rather than to general and abstract principles." Another interpretation of Evans-Pritchard' stance may be formulated as follows: in Evans-Pritchard's view, in order to highlight contradictory arguments among the Azande, Westerners should artificially gather conflicting assertions that the Azande produced in different contexts and take them as if they were formulated at the same time. Or Westerners would have to ignore essential elements that guide the Azande's arguments and actions:

> Throughout, I have emphasized the coherency of Zande beliefs when they are considered together and are interpreted in terms of situations and social relationships. I have tried to show also the plasticity of beliefs as functions of situations. They are not indivisible ideational structures but are loose associations of notions. When a writer brings them together in a book and presents them as a conceptual system their insufficiencies and contradictions are at once apparent. In real life they do not function as a whole but in bits. A man in one situation utilizes what in the beliefs are convenient to him and pays no attention to other elements which he might use in different situations. Hence a single event may evoke a number of different and contradictory beliefs among different persons. I hope that I have persuaded the reader of one thing, namely, the intellectual consistency of Zande notions. They only appear inconsistent when ranged like lifeless museum objects. When we see how an individual uses them, we may say that they are mystical but we cannot say that his use of them is illogical or even that it is uncritical. I had no difficulty in using Zande notions as Azande themselves use them. [1, pp. 221–222]

At any rate, do Azande appear rational to Evans-Pritchard? In order to assess the rationality of this people, the anthropologist takes other elements into account. He actually makes his mode of assessment as well as his views on logic more explicit in other writings. These writings were published in the 1930s in the *Bulletin of the Faculty of Arts* of the University of Egypt [3, 4]. In these articles, Evans-Pritchard criticizes Lévy-Bruhl's theory of primitive mentality, and in particular he challenges the idea that "primitives" could not think logically.

Before we investigate Evans-Pritchard's claims further, it is worth having a look at Lévy-Bruhl's views expressed in *Primitive Mentality* [5], first published in French in 1922 [6]. Lévy-Bruhl envisions logic as a set of logical principles which, first and foremost, include the principle of contradiction, also called the law of contradiction.[3] He does not give any definition of this law, nor does he provide much detail about the other principles to which he refers. However, he appears to view logic as belonging to the realm of processes of thoughts. He links logic and its principles with habits that are deeply rooted in Western thought, to the point that these have become its necessary conditions [6, pp. 47–48, 135]. Lévy-Bruhl invokes the

[3] On the evolution of Lévy-Bruhl's claims, see Lloyd ([7], p. 1), Keck [8].

specificity of European languages to explain this deep-rootedness. He refers to H.P. Steensby to claim that European languages are more appropriate for processes of logical thinking than primitive languages [6, pp. 505–506].

Based on this view of logic, Lévy-Bruhl refers to the principle of contradiction to build his notion of pre-logical thinking. He defines this way of thinking as being "most often indifferent to contradiction" [6, p. 85]. In this framework, "the principle of contradiction does not govern the links between representations as it does for us" [6, p. 99, my translation]. In other words, pre-logical thinking refers to a way of thinking which *tolerates* contradictions, or which does not *systematically* apply the principle of contradiction [6, pp. 42, 104, 106–107, 135, 153, 522]. Lévy-Bruhl uses this definition to challenge missionaries who view "primitives" unwilling to adhere to principles of the Gospel as being deprived of logic [6, pp. 13–14].

He uses this view on logic, as well as examples of contradictory representations, to depict "primitives" as beings endowed with limited reasoning capacities. However, Lévy-Bruhl does not simply invoke their occasional violation of the law of the excluded middle to talk about their limited reasoning capacities. He also refers to their mystical representations, to their limited capacity of grasping causal relations, as well as to their intuitive, based on flair and poorly conceptual way of thinking [6, pp. 49–50, 86–89, 242–243, 468, 516–519]. In other words, Lévy-Bruhl refers to logic, but also to many other elements to assess the peoples' rationality.

By comparison, Evans-Pritchard above all refers to a notion of coherence when he uses the term "logic" in the papers he published in the *Bulletin of the Faculty of Arts* of the University of Egypt. He also attributes another meaning to this word. He refers to the capacity of producing accurate inferences, however valid the assumptions from which they are drawn. Now, Evans-Pritchard does not explain what "inference" means for him. Nevertheless, it appears that this object belongs to the realm of mental processes in his view. This is a crucial fact since, according to the anthropologist, "primitives" have mental capabilities which are identical to those of the Westerners. Therefore, according to Evans-Pritchard, "primitives" are able to produce accurate inferences, and thus, think logically.

Consequently, for the anthropologist, "primitives" cannot be portrayed as being irrational for want of logic. Undoubtedly, Evans-Pritchard claims that mystical views of the world held by "primitives" do not conform to the reality and are not objective in general. But he makes a distinction between an ability to produce a coherent reasoning on the basis of valid or even invalid assumptions and a capacity to produce objective representations. For Evans-Pritchard, the former characterizes logical thinking, while the latter is typical of scientific thinking.

In Evans-Pritchard's objectivist view, "primitives" are logical. Their system of representations may result from valid inferences and may be coherent, although these representations are not scientific, since mystical forces do not exist. In so doing, Evans-Pritchard disagrees with Lévy-Bruhl. He does not invoke any lack of logic or any logical specificity to depict non-Westerners as irrational, to attribute them limited reasoning skills, or to describe their ways of thinking as less elaborate than those of the Westerners.

Evans-Pritchard's arguments have generated long-running and serious debates. The participants have mobilized different views on logic to reassess the rationality of non-Westerners, and especially of the Azande. In order to illustrate this point, let us study Winch's critique of Evans-Pritchard in a paper entitled "Understanding a Primitive Society," published in 1964 [9].

4.4 Some Rather Unconstraining Formal Rules

Like Evans-Pritchard, Winch does not portray the Azande as irrational for their lack of logic. As a matter of fact, he does not consider them less rational than Westerners. Besides, Winch criticizes Evans-Pritchard's notion of lack of objectivity. According to Winch, claiming that Zande views do not conform to reality is highly problematic [9, pp. 308–309].

Winch does not dismiss the idea that there is a reality that exists independently of human representations. However, he argues that it is not obvious for an individual who belongs to a given culture to decide whether an assertion expressed in the framework of another culture conforms to reality or not. Winch believes that Evans-Pritchard especially underestimates some issues that Wittgenstein addressed regarding the peculiarities of the languages in which we express our representations of reality [9, p. 313]; [10, 11]. "Conforming to reality" is not such a plain criterion to be used to distinguish between rational and irrational thinking when no logical incoherence is at stake. In particular, this notion is useless to claim that a primitive system of representations is irrational, like in the Zande case.

According to Winch, a primitive system of representations based on magic, as in the Zande case, represents a universe of discourse that is no less coherent than that of Western science. By and large, beliefs and practices are equally rational in both cases. Indeed, Winch believes that all methods developed in the name of science should not be viewed as rational *a priori* [9, p. 309]. He also considers that Westerners, like Azande people, do not resort to one single type of causality for all their behaviors and reasoning [9, p. 320].

So, if Winch does not use the notion of "representations conforming to reality" to assess Zande rationality, does he share Evans-Pritchard's appraisal of the logical nature of Zande thinking? Does he have the same views on logic and on how to link rational thinking with logical skills?

First of all, Winch's views on logic are quite different from those held by Evans-Pritchard. They are of formalistic and propositionalist natures. "Logic" refers above all to a notion of formal consistency of a set of rules and assertions [9, p. 318]. Although Winch does not give much detail about this notion, he seems to associate it with a lack of contradiction. At the same time, Winch refers to the work of a few contemporary logicians and philosophers of logic such as Russell and Wittgenstein [9, p. 314].

His representations of logic thus tend to be more circumscribed than those of Evans-Pritchard. Winch links this notion with a set of issues that are specific to Western culture, and especially Western science, which are alien to Zande culture. Therefore, he does not claim, like Evans-Pritchard, that the Zande way of thinking relies on the same logic as that of Westerners. In other words, although he does not challenge the consistency of the Zande way of thinking, he does not either correlate this way of thinking with a set of Western theoretical issues that, in his eyes, define the field of logic.

In this analysis framework, the articulation of peoples' rationality with the issue of logical thinking is assessed anew. According to Winch, Westerners are unable to view rules in a given culture as rational when these are not formally consistent [9, p. 318]. Indeed, there are some limitations for any individual belonging to a given culture to grasp other forms of rationality of other cultures. As part of these limitations, it is impossible for Western authors and their readers to renounce formal consistency. According to Winch, the formal consistency of rules of reasoning and behavior is not only an inescapable criterion of rationality for Westerners. It is also a necessary condition for descriptions to be intelligible to Westerners [9, p. 307, 312].

One may think that this argument leads Winch to claim that Westerners may not view Azande people as rational. But Winch does not draw this conclusion. Indeed, he claims that the requirement for formal consistency in the rules of reasoning and behavior is but a light constraint. He argues that this requirement partly determines the truth values of propositions, like in the framework of propositional calculus. But it does not determine them entirely. These truth values are also linked to the truth values that are assigned to initial statements used in the calculus [9, p. 318]. Furthermore, Winch claims that many arguments may always be used in order to explain why two apparently contradictory rules or propositions are in fact compatible [9], p. 312]. Seeming contradictions may well vanish once the meaning and the application of the context of rules and propositions are properly investigated [9, p. 318]. This applies in particular to the case of Zande culture.

It is now clear why logic, understood as a set of Western rules of formal consistency, plays a limited role in assessing peoples' rationality in Winch's views [9, p. 315]. According to Winch, this assessment should not rely on an inappropriate confrontation of the rules of the society investigated and those of the analyst, even if they were of a logical nature [9, p. 317]. Winch believes that in order to appraise its coherence, the Zande way of thinking has been confronted with the rules of Western logic in an inappropriate manner. In his view, the rules of the culture investigated and the contexts in which they apply should be fully understood in order to check their consistency [9, p. 319, 321].

Winch's analysis has been challenged by other readers of Evans-Pritchard. In his book *Knowledge and Social Imagery*, Bloor [2] criticizes both Winch's and Evans-Pritchard's claims, based on different views of logic and on its utility for assessing the peoples' rationality.

4.5 Portraying Logic as Being Subjugated to Institutions and Circumvented by Informal Thinking

According to Bloor, both Winch and Evans-Pritchard endow logic with a power which it does not possess. This power consists in being able to jeopardize an institution like Zande witchcraft. This would happen if the members of the society investigated perceive a logical problem in the way the institution works. Bloor then claims that Winch and Evans-Pritchard explain the stability of Zande witchcraft as an institution in two different ways. According to Bloor, Evans-Pritchard believes that Zande people have institutionalized a logical error, or have at least been relatively blind to it. Bloor also argues that Winch assumes that Zande logic is fundamentally different from Western logic.

I just presented my reading of Evans-Pritchard. It differs from Bloor's reading and there is no need to dwell on this point. However, it is interesting to analyze Bloor's views of logic, and how the author uses them to challenge Evans-Pritchard's and Winch's analyses.

Knowledge and Social Imagery, first published in 1976, conveys views on logic that in many respects can be compared to the Ancient Greeks' approaches of the discipline, and especially to syllogistic approaches. Bloor insists on taking the dynamics of logical thinking into account. However, how he conceives these dynamics appears quite limited and loosely connected with the evolution that logic as a discipline has undergone since the beginning of the twentieth century. Bloor likens logic to syllogisms, and to notions of formal reasoning and rules of inference about propositions [2, pp. 131–146]. His view of logic is above all of a propositionalist nature. Moreover, Bloor seems to conceive the dynamics of logical thinking as how the rules adopted by a given society change over time. However, the syllogistic nature of these rules allegedly remains immutable.

In fact, Bloor does not depict logic as a scientific discipline, but as something which is uniformly distributed in every society. Within a given society, logic is everyone's business. It is collectively regulated. It provides the principles of reasoning and behavior of everyday life, and also of all scientific disciplines in the Western world. In other words, Bloor connects logic with the institutional framework of reasoning taken up by each society [2, p. 145]. Consequently, the matter of logic cannot be reduced to a psychology of reasoning although Bloor evokes logical thinking. In order to draw such a homogenous picture, Bloor himself translates various kinds of statements into logical ones. For instance, "the whole is greater than the sum of its parts" is not treated as prose, but as a syllogism that Bloor himself produces while translating this statement [2, p. 135].[4]

Now, how can Bloor claim that logic has so little power over the fate of institutions if he believes it is so deeply ingrained in each society? Bloor thinks that logical rules and propositions do not really constrain the production of reasoning, the collective management of behaviors, and the working of institutions. Indeed, in his view, the link between a rule and a case that is supposed to be governed by it must

[4] This approach may be compared to Stark's treatment of this statement as a "purely formal" proposition ([12], p. 163).

always be built. The application of a rule or of a formal reasoning in a given instance may be easily circumvented thanks to adequate informal arguments if it threatens the stability of an institution to which people are attached.

Inspired by Mill's theory, Bloor claims that logic does nothing but record common forms of reasoning within a given society. Its main function is of a mnemonic and accounting nature [2, pp. 132–133]. Citing Wittgenstein, he adds that logical necessity and moral necessity are of the same nature. Bloor argues that we are constrained by some forms of reasoning in the same way as we have to consider certain forms of behavior as being legitimate, since we take certain forms of life for granted:[5]

> If we are compelled in logic it will be in the same way that we are compelled to accept certain behaviour as right and certain behavior as wrong. It will be because we take a form of life for granted. Wittgenstein expressed it neatly when he said in the 'Remarks' (1956): 'Isn't it like this: so long as one thinks it can't be otherwise, one draws logical conclusions.' (I, 155). Nevertheless, Wittgenstein believes it is right to say that we are compelled by the laws of inference: in the same way as we are compelled by any other laws in human society. [2, p. 138]

But according to Bloor, the informal always circumvents the formal. Formalism is nothing but a way of presenting a reasoning. It cannot be the founding principle of the latter. Reasonings in reality go from the particular to the particular by applying past cases to current cases. They do not go from the general to the particular by applying general rules to particular cases. That is why it is always possible to make formal rules compatible with any given situation. Producing an adequate informal reasoning suffices to do so:

> How does the priority of the informal over the formal express itself? The answer is twofold. First, informal thought may use formal thought. It may seek to strengthen and justify its predetermined conclusions by casting them in a deductive mould. Second, informal thought may seek to criticise, evade, outwit or circumvent formal principles. In other words, the application of formal principles is always a potential subject for informal negotiation. This negotiation is what Mill referred to as an interpretive or hermeneutic process. It concerns the link which must always be forged between any rule and any case which allegedly falls under that rule. [2, p. 133]

According to Bloor, social scientists do not need to look for logical foundations to behaviors and propositions. The latter only hold as long as they are required by, or compatible with, institutions. Any logical justification for them is nothing but a facade. That is why formal contradictions cannot affect the stability of Zande witchcraft for Bloor. Such contradictions may be easily circumvented by proper informal reasonings:

> What then of the logical inference that threatens the whole clan? The answer is that it is no threat at all. There is no danger of their stable beliefs being called into question. If the inference ever became an issue the threat would be deftly negotiated away, and this would not in itself be difficult. All that is needed is that a few cunning distinctions be drawn … Logic poses no threat to the institution of witchcraft, for one piece of logic can always be met by another. Not even this is necessary unless someone uses the inference in order to pose a threat, and if they do, it is the user not the logic that is the threat. [2, p. 141]

[5] See also Wittgenstein ([13], p. 155).

In the framework of this social relativism, and more precisely of this institutional relativism, referring to logical norms of behavior and reasoning to assess the people's rationality is simply out of the question. For this peculiar reason, Bloor also does not portray Zande people as irrational due to a lack of logic [2, p. 145].

4.6 Conclusion: Do Social Scientists Refer to Logic with Great Care?

We could certainly go on analyzing this debate and studying the arguments of other authors who participated in it or whose writings were discussed by its participants. The list of authors could include Alasdair MacIntyre [14], Dan Sperber [15], Bruno Latour [16, pp. 179–214], Geoffrey Lloyd [7], Gilles Gaston Granger [17, pp. 139–179] and Cora Diamond [18], among others. Undoubtedly, very diverse views and uses of logic would emerge as we proceed, some of them being quite sophisticated and fruitful. We would also show how logic is an object of debate within and between various disciplines of the social sciences and the humanities.

In the writings I just analyzed, it appears that authors adopted diverging principles to assess the logical dimensions and rationality of behaviors and reasonings, based on different, and sometimes quite basic views of logic. But it also appears that the nature of these views led the authors to refrain from blaming the Azande for being irrational due to a lack of logic. On the basis of this observation, should we worry about the views of logic and their uses among social and human scientists since the beginning of the twentieth century? Or is the situation less dramatic than we may have thought, especially if we compare it, for instance, with nineteenth-century views of naturalist anthropologists (Blanckaert, this volume)?

Geoffrey Lloyd's cautionary statement against hasty denunciations of irrationality based both on his criticism of the notion of mentalities and on a fully historical approach to logic appears to speak in favor of the last assumption [7]. So does ethnomethodological approach that comes down against the use of logical norms to assess the rationalities of individuals in their everyday life [19, pp. 262–283],[6] or, for instance, John Dewey's views on logic and "primitives" (Frega, this volume).

Of course, it is not possible to answer the questions I have just raised on the basis of this limited set of writings.[7] Some issues which go beyond peoples' rationality and which relate to other aspects and consequences of colonialist ideologies need also to be addressed (Pratt, this volume). The inquiry should therefore be pursued.[8]

[6] On the evolution of the representations and uses of logic in ethnomethodology, see Livingston [20] and Lynch [21].

[7] For additional developments on this issue, including a discussion of Marcel Granet's views on Chinese modes of thought, language and logic, see Rosental [22].

[8] I thank Julie Brumberg-Chaumont for her suggestions on a draft of this paper, and Sébastien Le Pipec for his help with English.

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Chapter 5
"Some Stages of Logical Thought": From Native Certainties to Acquired Doubts

Roberto Frega

Abstract This chapter explores some basic tenets of pragmatist philosophy of logic to inquire into its fruitfulness to understand diverse patterns of thinking. Reference will be made to C. S. Peirce theory of reasoning as developed in his famous paper "The Fixation of Belief" and to John Dewey's mature logic of inquiry. The different phases of Dewey's philosophy of logic are examined in turn. It will be contended that Dewey completes the process of naturalization of thinking begun by Peirce, developing an anthropology of thought and logic that places the practice of doubting at its heart. The upshot of the paper is that doubting is at the same time a practice which demands training and the potential source of a pleasurable experience, provided an initial fear of incertitude is overcome. The paper follows the various logical stages through which the ambivalent value of doubt is dealt; the evolution that is observed at the level of humanity, of individual growth, and of western civilization.

Keywords C.S. Peirce · John Dewey · Pragmatism · Inquiry · Doubt · Philosophy of logic · Naturalism · Anthropology · Evolution · Native logic · Science · Discovery · Judgment

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5.1 Introduction

In 1900, at the age of 41, John Dewey publishes an article of logic titled "Some stages of logical though" [1] which, as the title implies, attempts to identify "stages" in the development of logical thinking. The evolutionary intuition implicit in the idea of stages provides a promising entry point to assess American pragmatism's contribution to the study of native logic. While it is Charles Sanders Peirce who, more than any other representative of this philosophical tradition, has provided long-lasting contributions to the advancement of logical theory, in this paper I will also draw from John Dewey's legacy to propose the outlines of a pragmatist theory of native thinking.

At the basis of the pragmatist approach to logic stands a practice-based concern for the concrete process of thinking. Blurring somehow the lines between logic and psychology [2], pragmatists were mostly concerned with beliefs as action-orienting states. Their overarching concern—Peirce's starting point—was to understand how human beings go about fixing the beliefs that will guide their actions. Logic, to this extent, is understood as being action-orienting, rather than truth-tracking. Logical thinking is, then, the process whereby human action is coordinated and made effective. To that extent, both Dewey and Peirce conceived thinking in the terms of a *doubt-inquiry process,* rather than in those of copying propositions to facts. Within this action-oriented approach, what logic should study, in historical as well as in normative terms, are the methods, proceedings, and practices through which beliefs are stabilized in practice, the methods whereby human beings solve the deeply practical question of deciding how to act, so that action can unfold, unimpeded. To this extent, logic has to do more with doubt that with truth. Its task consists in making the practice of doubt productive for the sake of intellectual inquiry into theoretical as well as practical matters. Both Peirce and Dewey developed taxonomies to identify and distinguish different methods through which this function is fulfilled. In an evolutionary perspective, they unfold as "stages" of logical thought (Dewey), whereas in a more systematic approach, they are conceptualized as "methods" for the fixation of beliefs (Peirce).

Since the question of the comparative merits of Dewey's and Peirce's logical standpoint has already received a large share of academic attention, this paper will examine this theme from a different perspective. I will endeavor to show that Dewey's idea of stages of logical thought adopts and dynamizes the Peircean idea of rationality in a way that proves more fruitful to inquire into the very idea of logical skills and their very first developments, to which this volume is devoted. By "adopting" I mean that Dewey consciously inscribes his conception of logic within a theoretical framework whose basic tenets were set by Peirce, whereas by "dynamizing" I mean that he transforms the ahistorical (systematic) exposition developed by Peirce into an evolutionary account explaining how logical thinking evolves, moving from one stage to the next, from the "infancy of logic" to a full scientific method.

As said at the outset, Dewey proposes to conceive the stages he identifies and discusses in terms of an evolutionary approach that is to say as steps in the historical evolution of the human species as well as steps in the psychological evolution of individuals. To that extent, there is a correlation between life forms and logical forms, which basis is behavioral, mediated by action as it is shaped by situational circumstances.

As a consequence of his pragmatist method and polemics with the theorists of primitive mentality of his day, the stages through which human thinking is said to evolve are not defined in terms of an improved capacity to attain truth. In that sense, we do not find in Dewey the idea of a transition from magical or religious to scientific thought, as was the case, for example, for Lucien Lévy-Bruhl, or Edward Evans-Pritchard. His perspective is, indeed, different, since he suggests to see the stages of logical thought in terms of a succession of different techniques whereby human beings succeed at calming the doubts that constantly disturb their intercourses with the world. Dewey sees the evolution of the human mind precisely in terms of a changing attitude towards the practice of doubting, of an increased capacity to passively endure and, later, actively entertain doubt for the sake of forming beliefs that are more effective in the control of action. It is the history of a technical mastery upon the uncertainties of life where an improved capacity to doubt takes the lead in the evolutionary mastery of action of the external world. From the vantage point of the species as well as of the individual, the evolution of thought is, therefore, inseparable from the transformation of our attitude toward doubting.

From the pragmatist standpoint, therefore, if the infancy of logic is characterized by the fear of uncertainty and by the revulsion against doubt, then intellectual maturity is qualified by a kind of mastery that can be appropriately described in the terms of a newly discovered *pleasure of doubting*.

Before going further into this exploration of Dewey’s theory of the stages of logical thought, in the next section I will briefly recall the basic tenets of Peirce’s theory of logic, and particularly his well-known taxonomy of methods for the fixation of belief. This quick detour will provide the background against which I will suggest to read Dewey’s logical theory and to offer some keys to interpret its meaning for understanding the history of logical forms.

5.2 Peirce: Rationality as the Fixation of Belief

“The Fixation of Belief” is probably the most famous paper ever written within the pragmatist tradition. It is nearly unanimously considered one of the building blocks of its epistemology, and provides the obligatory entry point for any account of its theory of logic. In this paper, published by Peirce in 1877, we possibly find the clearest pragmatist definition of the nature of thought and, accordingly, of the task of logic.

Peirce’s take on the place of logic in human life starts off in evolutionary anthropology. As Peirce explains:

> Logicality in regard to practical matters … is the most useful quality an animal can possess, and might, therefore, result from the action of natural selection; but outside of these it is probably of more advantage to the animal to have his mind filled with pleasing and encouraging visions, independently of their truth; and thus, upon unpractical subjects, natural selection might occasion a fallacious tendency of thought. [3, p. 112]

This revulsion against doubt is a natural state for human being, something which is native to us, since we come to the world endowed with it. We see here emerging a tension between the positive consequences of logical thought—the control of action—and the negative effects of its exercise—psychological suffering associated with the pain of doubting. This perspective sets the stage for a sort of medical trade-off between the benefits of doubting and the displeasurable effects engendered by this activity. In Peirce's terms:

> Doubt is an uneasy and dissatisfied state from which we struggle to free ourselves and pass into the state of belief; while the latter is a calm and satisfactory state which we do not wish to avoid, or to change to a belief in anything else. [3, p. 114]

For the purposes of this article, it is important to stress that according to this pragmatist view point, truth plays no function in the general definition of the function of thought. Indeed, as Peirce himself clarifies:

> The sole object of inquiry is the settlement of opinion. We may fancy that this is not enough for us, and that we seek, not merely an opinion, but a true opinion. But put this fancy to the test, and it proves groundless; for as soon as a firm belief is reached we are entirely satisfied, whether the belief be true or false. [3, p. 115]

If there is a difference between ways of thinking, or between infant and adult logics, it will then not concern their different capacity to achieve truth, but rather their different way to bring stability to our systems of beliefs. Peirce then defies John Stuart Mill's moral view that it is better to be a dissatisfied Socrates than a satisfied pig. In the naturalistic terms of pragmatist logic, there is no room for a moral interpretation of logical thinking.[1]

As it is known, Peirce distinguishes between four major methods that human beings have developed with the aim of fixing their beliefs. Peirce is not interested in how human beings came to identify these methods, nor on their real diffusion across peoples, cultures, or ages. His point of view is the perspective of the logician, and his concern is with the logical specificity of the methods. What he aims to do, is to provide a logical typology rooted in the psychological structure of human mind.

The first method identified by Peirce is *the method of tenacity*. This method simply consists in clinging to one's opinion without ever leaving room to the possibility of doubt. This is the degree zero of inquiry, since doubt is rejected from the start. The advantage of this method lies in the maximization of the pleasurable quality of certainty. From a naturalist standpoint, this method makes perfectly sense, and as long as it works, no objection can be moved against it. If human beings could live

[1] For recent interpretations of Peirce's logic as naturalistic, see [4, pp. 127–149]; [5, pp. 65–75]; [6, pp. 18–31].

without ever facing the unsettling experience of uncertainty, they would be the happiest living creatures. The problem of this method, however, is that it cannot stand to its high expectations. Its biggest fault lies in its incapacity to take the standpoint of others into account. Once two individuals confront each other with contrasting beliefs, the method of tenacity leaves them with a clash they are unable to surmount. Its failure, in this sense, is more social than psychological: it may succeed in fixating the beliefs of an individual, but not those of a community.

The second method introduced by Peirce is *the method of authority*. Like the first one, this method too is to be found in the majority of human societies. Here the social dimension of belief is taken into account, and the problem of disagreement raised by the first method is solved through a social mechanism which assigns to selected individuals the power to establish the beliefs that all the others will have to adopt and follow. Culturally speaking, this method has been much more successful than the previous one. Its practical success has been such that in many everyday circumstances, even today, human beings continue to rely on this method to fix their beliefs.

A third method, that Peirce calls *a priori*, emerges out of the deficits of the second, insofar as the institutional or authoritarian conditioning of individual opinion can never be complete—not even in totalitarian states—so that sooner or later forced imposition loses its legitimacy, and “a different new method of settling opinions must be adopted, that shall not only produce an impulse to believe, but shall also decide what proposition it is which is to be believed.” [3, p. 118]

The basis of this new method is agreement achieved through communication. This method, to be found in all great civilizations, is for Peirce tainted by its methodological lack of resources for securing stability to beliefs, insofar as it does not provide a solid ground for producing agreement out of the plurality of individual beliefs.

Peirce’s solution to the instability brought in our beliefs by the social impulse is offered by a method, actually the only one, capable of anchoring beliefs to reality, that is to say to something which is independent from human mind, “something upon which our thinking has no effect.” This is *the method of science*.

While I’ am not convinced that Peirce’s theory of the fixation of belief can deliver relevant hints for a general discussion of logical forms like the one here pursued, Dewey’s reformulation of his basic intuitions is much more pertinent, and it is to it that I now turn.

5.3 Dewey’s Evolutionary Account of Thinking

Dewey expresses in the clearest terms his acceptance of Peirce’s model of human thinking when he claims that “the natural tendency of man is not to press home a doubt, but to cut inquiry as short as possible.” [1, p. 152]

Avoiding doubt and uncertainty is a natural tendency for human beings, one that aptly describes the infancy of logic at the level of individuals as well as of the

human species. In the longest part of human history and, for many individuals, in the longest part of their life, doubting is associated with irritation, displeasure, and suffering. Whatever unsettles beliefs and calls for efforts at resettling them is seen with suspicion. The proximate justification for this natural attitude lies in its psychological bases: doubting is unpleasant and human beings strive to avoid suffering.

Yet, as Dewey contends, this attitude has a major downside, which is its poor effectiveness at stabilizing the beliefs which guide our actions. This fact creates a sort of pragmatic contradiction, since the avoidance of inquiry intensifies the need of inquiry itself: the worse we fix our beliefs, the more they will be challenged by reality, and the more we will have to face some degree of displeasure. Hence the idea that a natural history of human thinking can be written, one which shows how our mastery of the doubt-inquiry process has developed in time. It is the history of how human beings have gradually accepted the lesser evil of doubting in order to avoid the greater evil of existential uncertainty.

This process of evolutionary improvement can be described at three levels:

1. at the level of humanity, as a way out of ancestral ways of thinking in which symbolic mastery of the environment, rather than technical control, are used to stabilize beliefs;
2. at the level of individual growth, as the process of individual maturation from infancy to adulthood;
3. at the level of western civilization, as the evolution of epistemology from its first awakening in Rome till the advent of experimental science.

Dewey refers to all these three processes to exemplify the properties of the four stages. To that extent, the idea of stages does not presuppose an opposition between civilized and uncivilized human beings, but rather a contextualist understanding of reasoning as an action-oriented method. Yet, as the evolutionary idea implies, the stages indicate a line of progressive improvement. This tension between a thorough contextualism and a normative take on the value of the different methods is somehow endemic in this approach, for reasons we shall discuss later.

In a rather programmatic way, Dewey writes:

> I wish to show how a variety of modes of thinking, easily recognizable in the progress of both the race and the individual, may be identified and arranged as successive species of the relationship which doubting bears to assurance; as various ratios, so to speak, which the vigor of doubting bears to mere acquiescence. [1, p. 151]

Let us then see how Dewey describes the four major stages of logical thought.

5.3.1 The Denial of Doubt and the Logic of Judgment

The initial stage is where the doubt is hardly endured but not entertained; it is no welcome guest but an intruder, to be got rid of as speedily as possible. Development of alternative and competitive suggestions, the forming of suppositions (of ideas),

goes but a little way. The mind seizes upon the nearest or most convenient instrument of dismissing doubt and re-attaining security. [1, p. 152]

The first stage is characterized by a nearly complete removal of doubt. Similarly to what Peirce dubbed “the method of tenacity,” stubbornness and the reject of any belief contradicting ours dominate human thinking at its (evolutionary and psychological) beginning.

Shortly later, Dewey explains further his ideas by saying:

> In the first stage of the journey, beliefs are treated as something fixed and static. To those who are using them they are simply another kind of fact. They are used to settle doubts, but the doubts are treated as arising quite outside the ideas themselves. Nothing is further from recognition than that ideas themselves are open to doubt, or need criticism and revision. Indeed, the one who uses static meanings is not even aware that they originated and have been elaborated for the sake of dealing with conflicts and problems. The ideas are just “there,” and they may be used like any providential dispensation to help men out of the troubles into which they have fallen. [1, p. 152]

The logical meaning of ideas lies in their capacity to fix beliefs and dispel doubts in the fastest possible way, which is to say by rendering the connection between beliefs and actions automatic.

The external juxtaposition of facts and ideas describes a situation where criticism is totally absent, a situation of epistemic passivity that Dewey associates to primitive ways of thinking. As he explains:

> We find an apt illustration of fixed ideas in the rules prevalent in primitive communities, rules which minutely determine all acts in which the community as a whole is felt to have an interest. These rules are facts because they express customs, and carry with them certain sanctions. [1, p. 154]

This way of fixating beliefs is by no means exclusive to primitive people, and indeed it can be spotted even in contemporary ways of thinking, anytime traditional norms are used to settle and confirm beliefs.

Contrary to his contemporary anthropologists such as Lévy-Bruhl, and in explicit opposition to social evolutionists such as Herbert Spencer [7], Dewey sees a deep continuity between primitive and modern ways of thinking. Whereas his contemporaries understood primitive thinking in terms of fallacious ideas and irrational ways of thinking, Dewey conceives the evolution of thought in terms of a progressive differentiation among methods of inquiry. To this extent, he is adamant that pre-scientific methods for dealing with doubts and fixing beliefs, far from having disappeared with the advent of modern science, continue to permeate contemporary life.

In continuity with Peirce’s appreciation of the method of authority, Dewey admits that:

> The conserving value of the dogmatic attitude, the point of view which takes ideas as fixed, is not to be ignored. When society has no methods of science for protecting and perpetuating its achieved values, there is practically no other resort than such crystallization. Moreover, with any possible scientific progress, some equivalent of the fixed idea must remain. [1, p. 156]

I want to turn your attention toward Dewey's observation that this stage is indeed already a stage of logical thought, rather than a stage of pre-logical thought. As he explains, talking about the way doubts are dispelled by a "judicial procedure," fitting each doubtful case under a fix idea, a pre-established rule, "this point of view has tremendously affected the theory of logic in its historic development." In this sense, we can rightfully talk about a primitive logic. Yet we are still in the infancy of logical thinking. More properly, we are confronted with a stage in which the normal attitude enforced by "instruction" is utterly alien to doubt, as thus, to thinking. As Dewey explains, when this instructed attitude is passively followed, and "ideas are doubly removed from the sphere of doubt," "there is a pre-judgment rather than judgment proper" [1, p. 155].

When this way of fixing ideas that Dewey associates with the social function of cultural transmission becomes generalized, the results are, therefore, uncritical ways of thinking which lead to social conservatism. This way of thinking is not only pragmatically ineffective; moreover, it has also undesirable socio-political consequences.

The two dimensions for Dewey are intertwined, as conservatism does not refer to a political attitude but, rather, to the uncritical preservation of customs and institutions beyond their effective social function.

5.3.2 Thinking as a Logic of Discussion

A second stage of logical thought is attained once fixity of beliefs ceases to be the only way to control action. At this stage, ideas begin to be perceived as correlates of cognitive acts that is to say as the intentional product of the mind. This implies the overcoming of the passive attitude found in the first stage: ideas are no more found, they are created. As creation implies change, ideas lose their original fixity: they are no more external entities such as objective facts, and the question of their stability becomes a social question.

As Dewey clarifies:

> When we substitute for ideas, as uniform rules by which to decide doubtful cases, that making over of ideas which is requisite to make them fit, the quality of thought alters. We may fairly say that we have come into another stage. [1, p. 157]

The attainment of this second stage is accompanied by an increase in uncertainty, the volatility of ideas, and, therefore, the need for more critical tools for the stabilization of beliefs. In a way that reminds of Peirce's third method, Dewey insists that the major challenge brought about by the second stage concerns the internal consistency of systems of ideas. The result is a quest for generality which Dewey describes in the metaphorical terms of a transition "from the 'judicial', where a case is just fitted into a fix rule, to the 'legislative', where the attention is drawn to the law one is willing to follow when dealing with a doubtful case." He also refers to the advent of the prophet as against the judge as paradigmatic man of knowledge.

Whereas the judicial model reduced the act of thinking to the mechanical application of pre-given rules, the legislative model conceives it in terms of the search for the most appropriate generalities that will then be used to guide action. As it was the case for Peirce, for Dewey too, collective discussion epitomizes the method for the fixation of beliefs that qualifies this stage.

Here again Dewey makes the logical implications of this transition clear by saying that:

> It is hardly too much to say that it was the emphasis put by the Greek mind upon discussion–at first as preliminary to decision, and afterwards to legislation–which generated logical theory. [1, p. 157]

With the second stage we are still in the domain of a way of thinking that continues to fail to fully take reality into account. This stage of logical thought, by opening up the play of ideas, introduces a profound instability in thinking, and threatens to unsettle individual as well as collective beliefs. As it was the case with Peirce, the journey toward logical maturity is initially characterized by an increase, rather than a decrease, in epistemic uncertainty. Out of his initial state of protective fixity, the human mind is exposed to unexpected sources of uncertainty. Set in motion by its own movement, thinking risks, therefore, to lose its function in guiding action and this, in a way, calls for the transition to a third stage.

5.3.3 Thinking as the Logic of Standardized Reasoning and Proof

The third stage of logical thought strives to provide some stability to ideas that have been unsettled by the social practice of discussion. Whereas Peirce saw in the social impulse a form of external pressure capable of overcoming the stubborn irrationality of the first method for the fixation of belief, Dewey sees in this conversational pattern a profound source of instability, against which methods of logical proof are devised. The aim is to find a method capable of bringing order in the uncontrolled play of ideas. Proof is that which enables the transition from discussion to reasoning. Yet proof in this context has a purely formalistic meaning. As Dewey explains:

> Reasoning is marshalling a series of terms and propositions until we can bind some doubtful fact firmly to an unquestioned, although remote, truth; it is the regular way in which a certain proposition is brought to bear on a precarious one, clothing the latter with something of the peremptory quality of the former. So far as we reach this result, and so far as we can exhibit each step in the nexus and be sure it has been rightly performed, we have proof. [1, 162]

This third stage is marked by axiomatic ways of reasoning, and a priori truths are required as premises for drawing valid conclusions. As Dewey contends:

> The scheduling of first truths is an organic part of any reasoning which is occupied with securing demonstration, surety of assent, or valid conviction. To deny the necessary place

> of ultimate truths in the logical system of Aristotle and his followers is to make them players in a game of social convention. [1, p. 164]

The opposition between social convention and logical truth marks the epistemological discontinuity between the second and the third stage. On the one hand, there is the educate play of conversation. On the other hand, the rigorous deduction of proof.

The attainment of this third stage, while ultimate from the standpoint of classical conceptions of logic, remains insufficient if seen from the standpoint of the pragmatist epistemology of rationality as inquiry.

As Dewey explains:

> As compared with the period of fixed ideas, doubt is awake, and inquiry is active, but in itself it is rigidly limited. On one side it is bounded by fixed ultimate truths, whose very nature is that they cannot be doubted … In the other direction all "matters of fact," all "empirical truths" belong to a particular sphere or kind of existence, and one intrinsically open to suspicion. The region is condemned in a wholesale way. [1, p. 166]

The awakening of doubt, while positive, is insufficient insofar as it is constrained by the rules of the axiomatic way of proceeding. In conclusion:

> This limitation upon inquiry settles the interpretation to be given thought at this stage–it is of necessity merely connective, merely mediating. It goes between the first principles–themselves, as to their validity, outside the province of thought–and the particulars of sense–also, as to their status and worth, beyond the dominion of thought. Thinking is subsumption–just placing a particular proposition under its universal. It is inclusion, finding a place for some questioned matter within a region taken as more certain. It is use of general truths to afford support to things otherwise shaky–an application that improves their standing, while leaving their content unchanged. This means that thought has only a formal value. It is of service in exhibiting and arranging grounds upon which any particular proposition may be acquitted or condemned, upon which anything already current may be assented to, or upon which belief may reasonably be withheld. [1, p. 166]

5.3.4 Experimental Reason or the Inferential Logic of Discovery

We achieve a fourth and last stage when the logical self-enclosure of thought is finally overcome. Here the metaphor of the law court is replaced, unsurprisingly, by that of the laboratory.

> In the laboratory there is no question of proving that things are just thus and so, or that we must accept or reject a given statement; there is simply an interest in finding out what sort of things we are dealing with. Any quality or change that presents itself may be an object of investigation, or may suggest a conclusion, for it is judged, not by reference to preexistent truths, but by its suggestiveness, by what it may lead to. The mind is open to inquiry in any direction. [1, p. 167]

The ultimate stage of thought is described in terms of the experimental logic of scientific inquiry, exactly as in Peirce. At this stage, "thought takes the form of inference instead of proof." To use familiar terms, inference refers to a synthetic

rather than an analytic way of reasoning. This advance and extension of knowledge through thinking seems to be well designated by the term “inference.” It does not certify what is otherwise doubtful, but “goes from the known to the unknown.” It aims at pushing out the frontiers of knowledge, not at marking those already attained with sign-posts. Its technique is not a scheme for assigning status to beliefs already possessed, but is a method for making friends with facts and ideas hitherto alien. Inference reaches out, fills in gaps [1, p. 168].

Emphasizing the pragmatic and creative dimension of inquiry, Dewey summarizes the logical meaning of this fourth stage with the formula “*Inventio* is more important than *iudicium*, discovery than proof.” [1, p. 168]

The decisive contribution of the fourth stage consists in opening up for the first time the entire domain of empirical facts for thinking. The exploration of singularity acquires an epistemological meaning before unconceivable.

In experimental science, “The interest is in the discrepant because that stimulates inquiry, not in the fixed universal which would terminate it once for all.” [1, p. 168]

Provocatively, Dewey contends that:

> The microscope, telescope, and spectroscope, the scalpel and microtome, the kymograph and the camera are not mere material appendages to thinking; they are as integral parts of investigative thought as were Barbara, Celarent, etc., of the logic of reasoning. [1, p. 169]

At this stage, as Dewey will remind elsewhere, an alteration of the quality of thought occurs, one that, moreover, affects the anthropological basis of thinking. What happens is that doubt ceases to be feared and escaped, that the search for knowledge does not proceed through the systematic closure of a conceptual image. A process of necessary education has taught human beings the pleasure of doubting. This is a profound transformation in the experience of human beings, at the anthropological as well as psychological level. The human mind oversteps the threshold of infancy not when it abandons magic or mythical ways of thinking, but once it learns to love doubt, to enjoy doubting instead of fearing it.

For Dewey, more explicitly than for Peirce, doubting is an intrinsic and decisive feature of reasoning. Doubt is something that needs to be entertained rather than dispelled. As he says, doubt needs to be chased back, we have to play with it, we need to learn how to entertain it in our mind. These and similar expressions show the kind of attitude human inquirers learn to adopt when they pass through the stages of logical thought. As a consequence, the different stages of thought are not defined according to their intrinsic rigor, or to their capacity to attain valid or true conclusions, but rather according to the way in which they succeed in making the practice of doubting creative.

5.4 Conclusion: The Pleasure of Doubting

It is from this vantage point that modern experimental science is seen by Dewey as making possible the emergence not only of a new epistemic configuration but, more profoundly, of a new *anthropological* era, one in which human beings, for the first

time in history, begin to take pleasure in doubting. This pleasure of doubt marks the definitive exit from the infancy of logic, and the attainment of what we could call a sort of practical or pragmatic maturity.

As he explains:

> Modern scientific procedure, as just set forth, seems to define the ideal or limit of this process. It is inquiry emancipated, universalized, whose sole aim and criterion is discovery, and hence it marks the terminus of our description. [1, p. 172]

Nearly thirty years after his seminal paper on the stages of logical thought, Dewey will reformulate in *The Quest of Certainty* his ideas through a dual scheme, where he will distinguish between two different approaches to the doubt-inquiry process. On the one hand, there is the attitude of those who, facing uncertainty, search inwards for a symbolic reconciliation with the world. This attitude is common to primitive people and to most of the western pre-modern intellectual achievements. As he notes, "exaltation of pure intellect and its activity above practical affairs is fundamentally connected with the quest for a certainty which shall be absolute and unshakeable." [8, p. 5]

In a profoundly innovative way, Dewey saw classical philosophy to differ only a little from primitive thinking, religion, and magic. Indeed, each in its own way these intellectual undertakings pursue the same quest for certainty. Their common denominator is the fear of doubt, and the idea that intellectual reflection can deliver definitive and immutable action-guiding beliefs.

On the other hand, there is the attitude of those who face uncertainty "by changing the world through action." This is the experimental attitude set forth by modern science. This stage is qualified by the fact that "man … has learned to play with sources of danger. He even seeks them out, weary of the routine of a too sheltered life." Yet to seek dangers out, to live in a situation of epistemic uncertainty, requires a new maturity which, for Dewey, is inseparable from the capacity to take pleasure in doubting.

"Enjoying the doubtful" [8, p. 182] becomes, therefore, the distinguishing trait of the last stage in the evolution of human rationality. The mature man, as opposed to humanity in its infancy, is not who knows better, nor the one whose representation of the world is more accurate. Neither is he the one who has definitively shaken off himself false beliefs. He is of course all this. But, more than that, the mature man is one who takes pleasure in doubting, who can entertain and endure this state of uneasy uncertainty that humanity in its long career has always feared and tried to escape. Enjoy the doubtful, rather than search for truth, is the formula which captures the pragmatist understanding of rationality as a never-ending process of epistemic revision dominated by the idea that beliefs are temporary and fallible guides in an ever-changing world.

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Part II
Educated and Disabled Men

Chapter 6
The Rise of Logical Skills and the Thirteenth-Century Origins of the "Logical Man"

Julie Brumberg-Chaumont

Abstract This paper is dedicated to the first universities and mendicant schools, where thousands of students began to converge during the thirteenth century. Logic played an unpreceded role in basic and higher education. A "Parisian logical model" of education was shaped at the University of Paris, adopted by mendicant Orders in their schools of logic (*studia artium*), diffused in all disciplines, and progressively spread in Southern Europe. Medieval education became heavily based upon logical, and even "logician" practices, with the "syllogization" of exegetical, disputational, and evaluation practices.

The notion of logical skill conveniently captures this unique situation for the discipline of logic, as well as the way medieval thinkers conceived of logic as a universal, transdisciplinary method, a natural operation of the mind, a modality of knowledge (*modus sciendi*), the very form of teaching and graduating, a "habitus," a technique (*ars*) and a science.

The divisions of Aristotelian logic, the "artificial logic," were for the first time naturalized and projected on the very structure of human mind, which was thereby "logicalized" and ascribed a "natural logic." A strong anthropological dimension was bestowed on logic. The discipline of logic was deemed a necessary instrument in the philosophical "perfection" and the Christian "reparation" of man as an intellectual creature by a group of logically skilled, professional philosophers and theologians, whereas men deprived of logical education were described as "logically disabled," and stuck into inferior forms of humanity.

The world of medieval intellectual elites displayed a variety of social uses of logic, beyond academic circles, especially in the performance of pastoral duties. The possible historical records of the social usefulness of logic are explored: for students, the majority in medieval universities, who left university without a degree, but with a solid logical education, for ordinary mendicant friars, dedicated to preaching and confession, who frequented logical schools, and for members of the parish clergy sent to the faculties of arts.

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6.1 Introduction

Logical skills acquired during the Middle Ages an unprecedented social significance for the training of intellectual elites, for their production, for the exercise of their functions, and for their (self-)representations. Far from being represented an intellectual skill among others, it was conceived as the "art of the arts," the general knowledge of what is knowledge, based upon the reflexive capacities of human reason, which are natural, but always remain in need of rectification and improvement. Logic was a social code and a general method of teaching that largely monopolized scholarly spaces. Since logic, as a science, was also the language in which rational reflection was theoretically targeted, it offered a model of recursive knowledge that could embody, for many medieval thinkers, the very essence of a self-constituting rationality.

Logic was given a new place in a rapidly expanding school organization. This was already the case in the schools of Northern Europe from the eleventh and twelfth centuries onward, where a special alliance was forged between a renewed Aristotelian logic and a nascent theology. Logic became dominant in the two important institutions which emerged in the course of the thirteenth century, namely universities and mendicant schools. It challenged grammar, the queen of the trivial disciplines during the High Middle Ages, and supplanted rhetoric, the culmination of Hellenistic and Roman education.

Universities were born in about ten important places, including Paris, Oxford, Bologna, and Montpellier, where hundreds, even thousands of students converged. Centers of religious studies, the *studia*, were also created by the newly born Orders, the Mendicants, whose houses quickly reached the hundreds all over Europe, especially among the Dominicans and the Franciscans.

At the beginning of the thirteenth century, logical teaching occupied a large part of the educational effort, when the faculty of arts was set up in Paris, and then in the universities that followed the "Parisian model." From the middle of the thirteenth century onward, logic was the subject of a dedicated, specialized teaching within the mendicant system of education, in schools of logic called *studia artium* (schools of arts).

Logical education gradually became more widespread in disciplines such as law, and in areas, such as Southern Europe, where it was not traditionally a basic disci-

pline, and where education was rather based on grammar and rhetoric, in accordance with the Roman model.

A logical modality was introduced in the exegesis of canonical texts and in the dispute, the *lectio* and the *disputatio*, the two main forms of teaching in the Middle Ages, so that medieval education came to be saturated with logical practices, whatever the faculty under consideration.

There was a massive schooling of knowledge, where the different disciplines, grammar, natural philosophy, theology, law, medicine, as well as logic itself sought to constitute themselves as sciences, following the model provided by Aristotle's *Posterior Analytics*. In the context of an *actual*, and not only theorized, logical formalization of discursive practices, syllogistic became the transparent underlying logic of all sciences, including itself.

Moreover, the logical modality of discourse took on an extended intellectual and cultural value, beyond academic circles. This can be observed in various written and oral practices, where the rigor of a strict syllogistic and disputational form is adopted, as can be seen, for example, in some works by Dante. Contrary to the Renaissance and the early modern period, Aristotelian logic represented a dominant culture, and not only as a school method.

The rise of logic as an educational and social norm goes hand in hand with the emergence of a new insistence on the anthropological dimension of logic among an elite of professional philosophers and theologians. This theory was based upon a Christian-Aristotelian doctrine of the rational soul, which made reason something that is possessed, by divine infusion, but rational thought something that is acquired by being exercized, that is to say: by being logically exercised. A philosophical tradition that valued "logical perfection" thus resonated with the Christian idea of "logical reparation." This presented, according to a model established in the twelfth century, the acquisition of the liberal arts as a reparation for the deficiencies caused in the soul by original sin. This approach was nourished by a new conception of logic no longer as an art of language (*ars sermocinalis*), but as an art of thinking and a technique of self-fashioning for the intellect, derived from Arabic philosophy.

The divisions of "artificial logic," i.e. the Aristotelian logic taught in schools, were projected onto the natural functioning of the human mind, called "natural logic"; thereby they acquired an unprecedented anthropological foundation. They were described as the technical enhancement of the three fundamental acts that the human mind naturally carries out, namely the formation of concepts, the combination of the latter in propositions, and the concatenation of these very propositions in inferences: we find here the famous "three operations of the mind," which will continue being discussed far into the early modern period. The three-fold division of the logic taught in schools enjoyed a homothetic correspondence with the three operations it was designed to regiment: the *Categories* (and its medieval companions) artificially enhanced and regulated the first operation, the *Peri hermeneias,* the second, and the *logica nova* (*Prior* and *Posterior Analytics*, *Topics*, *Sophistici Elenchi*), the third one. As a result of the rejection of any form of self-education and of the adoption of a methodological conception of knowledge, logic came to be described as an essential instrument for perfecting of the essence of man, through

the achievement of speculative knowledge. As a counterpart, various categories of men deprived of logic, be it natural logic or artificial logic, were rejected to the margins of humanity, as "logically disabled" beings.

The logicization of the human mind, or, conversely, the naturalization of logic, combined with the definition of a methodological essence for knowledge acquired mainly through teaching, resulted in a complex situation that can be adequately described on the basis of the notion of "logical skill," the Latin equivalent of which would be *peritia*, and sometimes *experimentia* (see below text quoted § 6.2.2).

The value bestowed on logical skills was part of a broader cultural context, where skills represented a rising value in a world of technical and intellectual practices, where practical and theoretical guides, the arts (*artes*), were multiplying. This was the case for liberal and mechanical arts, but also for newly regimented practices, such as pastoral care (the arts of confessing, the arts of preaching), education (mirrors), or the art of writing letters (*ars dictiminis*). This art, where written legal-rhetorical practices were being formalized [1], can be seen as a counterpart to the formalization of theoretical practices offered by logic. The theorization of how these arts should regiment practices, through a theoretical knowledge (*artificialiter*, *de arte*) and a knowledge of their application (*formaliter*, *ex arte*), as well as the rejection of practices conducted without art (*sine arte*), or left to chance (*casu*), had appeared as early as the twelfth century [2]. The idea that some practices should be exercised by some special social groups endowed with specific skills, and that these skills are the result of formal and practical learning, within the framework of disciplines designed to produce reflexive knowledge of themselves, all notions that sound as obvious to our modern ears, were indeed put forward and developed during the Middle Ages. This was the case in the twelfth century, in a context of a strong artisanal, urban, intellectual, and educational development, and it was even more so during the thirteenth century, with the birth of universities, the renewal of pastoral care, and the development of civil and religious administrations. Skills were appropriated by social groups. They were partly incorporated, especially if they represented basic knowledge such as grammar (Latin) and logic. Logical skills were thus valued not only positively, as can be seen in the numerous praises of logic written at the time, but also negatively, through the stigmatization of those who were uneducated, incapable, and incompetent in logic.

As a result of the logicization of scholarly practices of discourse and, in general, of the normativity of regimented Latin used in the schools, whose mastery depended as much on logic as on grammar, logic learned and implemented in ubiquitous logical practices was incorporated, shared, applied, and reflected upon. It was for a time a total form of life, the bearer of an anthropological ideal in the eyes of a large number of the medieval intellectual elite, before it saw its role and meaning challenged—without however fading away—under the effect of the profound changes in medieval rationality that characterized the fourteenth century.

All aspects of this history cannot be studied here in detail. We propose to highlight the importance of logical skills in three aspects, limiting ourselves to academic circles. First, we describe the quantitative and qualitative importance of logical practices in medieval education. By "logical practices" we mean the disciplinary

teaching of logic, whether theoretical or practical, which could be provided in classes of logic, but also sometimes in medicine, law, and theology, at the university, in mendicant training centers or elsewhere; we also include the role of logic in practices of teaching, evaluating, and gaining university degrees. Second, we attempt to describe these practices as "logician practices," to identify the role of logic in the acquisition and certification of knowledge, and the way it has been theorized, with a special focus on the questions of the "usefulness" and "necessity" of logic. We emphasize the anthropological significance bestowed on logical skills. The third, last part of this essay offers a brief inquiry into historical clues that may shed light on the reality of the social usefulness of logical skills, in scholarly worlds and elsewhere, especially for the performance of pastoral duties, the art of which was called "the art of the arts," in the same manner as logic.

6.2 Logical Skills in the Thirteenth Century: The Rise of Logical Education

6.2.1 The Pervasiveness of Logical Education: The Faculty of Arts as a "Faculty of Logic"

The best part of the teaching which officially took place at the faculty of arts was dedicated to logical learning. This applies to the whole program in arts in Paris during the early thirteenth century, and then to the undergraduate program, the BA, for the rest of the Middle Ages, in Paris and in other universities organized according to the "Parisian model."

The dominance of logic within the nascent faculty of arts and its prominent place in the educational system has long been recognized by scholars. Claude Lafleur recalls that the *Student Guide*, composed in Paris during the 1230s or the 1240s and intended to help students obtaining their degrees, is devoted almost exclusively to logic, and in a lesser proportion to grammar ([3], p. 15, [4], pp. 147–148 and note 26). The same can be said about the other well-known student guide, the *Communia artium liberalium* (ca 1250), intended to help students prepare for the "Licence" (*licentia docendi*),[1] where logic (and grammar) dominate almost equally, for approximately 75% of the content [6]; natural philosophy and metaphysics are completely absent ([4], pp. 160–161). Olga Weijers also argues that candidates for the Licence in the 1250s probably did not yet need to be prepared to answer questions about natural philosophy [7]. Luca Bianchi has insisted upon the "triumph of logic" and the "blessing" of the Aristotelian *Organon* by the papal legate, Robert of Courson ([8], p. 97), when the latter decided on the compulsory, as well as the forbidden texts to be studied at the faculty of arts in 1215, a "blessing" confirmed by the papal bull *Parens scientiarum* in 1231.

[1] For the rites and rules of exams, see also [5].

Let us first recall that logic (and theoretical grammar) as taught in the faculty of arts corresponds to a level of education that can be called "higher education," since it belonged to university training, as opposed to primary teaching concerned with literacy or numeracy, and as distinguished from a "secondary" level of education, a level where the teaching of the rules of grammar, what was by then called "positive grammar," was organized (see [9]). But it nevertheless remained at a propaedeutic level, in contrast with the "higher" faculties of the universities, namely the faculties of law, medicine, and theology.

However, the teaching of logic at the faculty of arts represented only a part of medieval logical education. Upstream, one type of logic, called "terminist logic," as well as some other types of elementary logic, were taught at a para-university or pre-university level (see [10]), equivalent to a secondary level today, in the same manner as "positive grammar." Downstream, there was a disciplinary teaching of Aristotelian logic in the faculty of theology, but also a teaching of "juridical logic" in the faculty of law (see [11]). The faculties of medicine witnessed a strong reception of Aristotelian logic into a medical doctrine already permeated with the epistemological theories found in Galen. This applies especially in Italian universities (Bologna, Padua), where there was no faculty of arts and where the arts belonged to the faculty of medicine (see [12–14]).[2]

The organization of the University of Paris corresponds to a "juvenile" type of university, where 75% to 80% of the total number of students, that is about three thousand individuals at the end of the thirteenth century, belonged to the faculty of arts. They were adolescents or very young men, between 13 and 21 years of age, supervised by more than a hundred masters who were themselves very young. Most of the North-European students converged in the University of Paris, almost unrivaled till the fourteenth century. Without being statutorily required, previous studies in the faculty of arts were standard among students of the higher faculties, especially in theology.

The years 1215–1230 witnessed an ecclesiastical takeover in the organization of the teaching content in the recently born University of Paris (ca 1200–1210). It saw the emergence of what we have called "a Parisian logical model" of education (see [15]). This consists of a pedagogical organization where the faculty of arts is dominated by Aristotelian logic completed, to a lesser extent, with advanced and theoretical grammar. At its beginnings, that is to say from the 1210s (see [16]), the faculty of arts was thus not, strictly speaking, a "faculty of arts", but a "faculty of logic" (and grammar). Logic was a discipline in its own right, which could not be adequately described as a part of philosophy, when looking at intellectual practices, as distinct from the abstract, theoretical divisions of philosophy of the time. Philosophy, assimilated to "natural philosophy," was considered as a "foreign" (Greek, Arabic) and potentially dangerous science, as opposed to grammar and logic. In the statute of

[2] For more information about secondary logical education, logic for "children," whether "terminist" or not, on the use, for elementary purposes, of a truncated version of the most influential logic textbook of the Middle Ages, the *Tractatus* by Peter of Spain, as well as on the teaching of logic in higher faculties, see [15], chapter "Logic *urbi et orbi*."

Cardinal of Courson in 1215 ([17], p. 78), logic occupies the entirety of the official program, with the exception of theoretical grammar. Only "dialectic" (*dialectica*), that is, the Aristotelian *Organon*, and the advanced grammar by Priscian are promoted to the rank of compulsory subjects at the university. The papal bull *Parens scientiarum* of 1231 reinforces and clarifies these prescriptions ([17], p. 138).

The constitution of the Parisian logical model corresponds to a profound restriction in the range of courses on offer.[3] It resulted from the "non-promotion" of the some "literary" and rhetorical disciplines that were still taught in the Parisian schools at the beginning of the thirteenth century. It also resulted from the introduction of the notion of "academic heresy"[4] (see [19]) into the history of the university. The latter concerned natural philosophy during the thirteenth century, but not logic and grammar, which are considered harmless, "ideologically neutral." This can be seen in some 1276 prohibitions, where only books of logic and grammar could be safely read in private ([17], p. 539).

Aristotle's books on metaphysics and natural philosophy could not be the subject of courses according to the Pope's legate in 1215; it had been forbidden to read the same books in private (*secreto*) or in public under penalty of excommunication since 1210 ([17], pp. 78–79). Natural philosophy was once again banned in 1231 ([17], p. 138). There are indeed hardly any preserved Parisian commentaries to natural philosophy before the late 1240s; the penetration of the "New Aristotle," although real, remained very slow before the mid-thirteenth century.[5] Natural philosophy was not prescribed until the mid-thirteenth century, with the mandatory curriculum of the faculty of arts in 1255. A large number of Aristotle's works on natural philosophy were then cited alongside logic as the object of a well-defined, compulsory course of study ([17], pp. 277–278).

After the introduction of a systematic teaching in natural philosophy, the primacy of logic still applied for the program for the BA, thereby occupying a large part of the efforts of the undergraduate students. This can be seen in the 1252 list of books that the BA candidate in the English nation must swear to have studied for 4 or 5 years ([17], pp. 227–228). This list contains only books of logic (and grammar), with the exception of Aristotle's *De anima*. The "logical (grammatical) BA program," remained standard during the fourteenth century, as can be seen in the 1366 description of the curriculum ([20], p. 145; see also [21], pp. 10–13), and then, *mutatis mutandis*, in the universities of Northern Europe organized according to the "Parisian model".

[3] As Nathalie Gorochov has pointed out, the activities of the masters of arts of the generation corresponding to the years of the emergence of the University of Paris (1200–1210) were extremely varied ([18], p. 125 ff.).

[4] For a critical discussion of the notion, see Bianchi [8], pp. 4–8.

[5] See [8], chapter "From proscription to prescription," p. 114, pp. 117–118, pp. 120–123, p. 124.

6.2.2 The Pervasiveness of Logical Education: Mendicant Policies of Logic

Mendicant schools of logic represent another aspect, at least as important as the previous one, of the history here presented. Mendicant friars, in the same way as monks, were forbidden to attend the faculty of arts. The middle of the thirteenth century witnessed the progressive creation of a network of specialized schools of logic, organized at a provincial level, in all provinces, over 2 or 3 years. Those schools were called *studia artium*, that is to say, "schools of arts." The very choice of this formula to designate schools dedicated solely to logic indicates how much mendicant Orders were the heirs to a "Parisian logical model" of education where logic still reigned almost unchallenged, in the mid-thirteenth century, that is when the mendicant system was established. For the sake of brevity and clarity, only the thirteenth-century Dominican *studia* are described here[6]; however, they remain representative for the Franciscans, despite a later development and strong specificities.

With the occasional exception of the schools of grammar created in the Dominican province of Spain, the schools of logic were, in the middle of the thirteenth century, the only schools where some secular sciences were taught, in addition to the schools of theology which had appeared earlier. The most advanced schools of theology, the *studia generalia*, were integrated into the faculties of theology of the universities. They mainly trained the future reader (*lector*) for the schools of theology with which each convent was endowed; this category of students was not to take a university degree. *Studia generalia* also trained a very restricted elite, the future theologians of the Order, who had to acquire university degrees in order to be recognized as masters of theology.

The first schools of logic were implanted in Provence (see [24]) and in Spain (see [25]) in the years 1240/1250; they were prescribed, for each province, at the level of the General Chapter of the Dominican Order as early as 1259 ([26], p. 99). They were actually generalized across all the other provinces from the 1270s onward, especially in Italy (see [27]). From 2 to 3 years were dedicated only to the study of Aristotle's logic. In contrast, the schools dedicated to philosophy had a different name, i.e. "schools of philosophy" (*studia philosophiae*) or "schools of natural [philosophy] (*studia naturarum*)". They were always less numerous with respect to those of logic; they were not created before the 1260s (in Provence) and generalized before the 1280s. The study of philosophy was to wait until the beginning of the fourteenth century in order to be prescribed at a general level.

At that time, as established by the 1305 General Chapter ([28], p. 12 ff.), attending a three-years training of logic was made compulsory, before access to training in philosophy was authorized and, only then, access to a school of theology. A rigid and compulsory study program was set up, which made logic the gateway to any political or academic career in the Order. This system of progression had no equivalent at the university. As we shall see in the last section of this paper, the schools of

[6] On the Dominican system of education, see [22, 23].

logic were attended by a significant portion of the "ordinary friars," trained only for performing their pastoral duties (preaching, confession).

It is not possible here to go into all the details of the other aspects of the history of logical mendicant education (for more on that topic, see [29]). It is however important to emphasize that the teaching of logic was implemented, in addition to this specialized level, in all the strata of mendicant education: upstream, with an introduction to elementary logic in the conventual schools, and downstream, with complementary, higher or "nursery" logical teaching, in the schools of theology. This theological teaching of logic was organized even in the *studia generalia* of the Orders, where the elite of the managers, teachers, and theologians of the Order was trained. The most important logical commentaries from the thirteenth century, read throughout the Middle Ages and still during the Renaissance, issued by Albert the Great, Thomas Aquinas, Giles of Rome, and John Duns Scotus, were produced in this theological context. A similar context is also to be considered for the famous *Sum of Logic* (ca. 1323/1325) by William of Ockham, a hugely influential text during the Middle Ages. The "Prefatory Letter" of this work clearly insists on the logical skills that are expected to be acquired and then perfected in the intellectual practices of theologians, beyond basic logic:

> For logic is the most useful instrument for all arts. Without it, **no science can be fully known**. It is not worn out by repeated use, after the manner of material tools, but rather admits of **continual growth through the diligent exercise *of any other science***. For just as a mechanic who lacks a complete knowledge of his tool gains a fuller [knowledge] by using it, so one who is educated in the firm principles of logic, while he painstakingly devotes his labor to the other sciences, acquires at the same time a **greater skill (*peritia*)** at this art […] Because it is often verified that younger people would start studying the subtleties of theology, or of other faculties, before they had gained **a solid experience (*experientia*)** in logic, and that they are then faced with difficulties, inextricable for them, but easily resolved or even non-existent for others [i.e. people skilled in logic], and do fall into numerous errors, I have been led to write this treatise [i.e. the *Sum of Logic*] ([30], p. 6).

Eventually, it should be pointed out that mendicant schools of logic were established very early on in areas where the "Parisian logical model" of education, described earlier, was not standard, i.e. in the South of Europe. These areas still favored a model of education closer to the Roman one, based on grammar and rhetoric, even in spaces that enjoyed a strong scholastic development, such as Italy, for which an "Italian model" of education has been described ([31], see also [32]). As noted by two scholars, respectively, for central Italy ([32], p. 406) and for the University of Montpellier ([33], p. 32), the presence of logic in southern schools and universities long remained "shadowy" during the thirteenth century. Logical education took hold and spread later, in law and medicine, especially in Bologna. Conversely, the presence of southern students at the University of Paris remained relatively low throughout the Middle Ages (see [34, 35]). It is thus reasonable to think that mendicant schools of logic represented, in these southern "logical deserts"—with the possible exception of Jewish scholarly circles (see [36])—the main vehicle for the spread of Aristotelian logical culture and for the "meridionalization" of the "Parisian logical model" during the thirteenth century.

6.2.3 *The Logical Modality of Teaching and Graduating at University*

As shown by Alex Novikoff [37], the Middle Ages witnessed a strong cultural diffusion of the practice of dispute. Medieval elites were in a situation of "disputational saturation," whether in academic circles, in a Church dedicated to "defensive argumentations" against "heretical deviants" (See [38], p. 125, ff.), or in schools and courts of law, where the judicial procedure was in the process of being codified (see [39–41]).

The studies conducted by Olga Weijers[7] have fully illustrated the crucial role devoted to disputes in university intellectual work, teaching and graduation at the faculty of arts, as well as in other faculties. Conducting and organizing disputes were compulsory in order for masters to perform their teaching duties: disputed questions conducted during classes dedicated to the exegesis of canonical texts; disputed questions organized in sessions held separately and supervised by the master during the teaching timetable; "solemn" public disputes, organized between university masters once a week, in which they had to participate at least once a year. Disputes were also organized between students.

In the faculty of arts, disputes were "sophismatic": they started from a sentence, a *sophisma*, which represented a logical "puzzle," a proposition whose truth conditions were very difficult to assert. This practice led to the writing of about one hundred and thirty sophismatic collections between 1200 and 1320, with one thousand and two hundred different *sophismata* discussed (see [47]).

According to the 1252 statutes of English Nation, sophismatic disputes were those in which BA candidates had to swear that they had participated for 2 years, as "respondents," in order to be eligible to conduct the special Lent disputes, called "determination (*determinatio*)," and get their BA degree. Following that, they had to conduct disputes for 40 days. They also had to have attended the "solemn" disputes for 2 years, and to have "answered questions" for 1 year ([17], p. 228). Regulations for disputes existed for graduating and teaching duties in the other faculties, in law, medicine, and theology, included Southern universities, such as Bologna, specialized in law, or Montpellier, specialized in medicine. Disputes were also a major aspect of teaching in the mendicant system of education (see [22], p. 25 ff.).

Active participation in a dispute was a fundamental rite of passage, which distinguished a passive stage of study from an active one, only as respondent, and then a pre-professional phase, after the Baccalaureate, when the student, as an "assistant," could teach basic classes (called "cursive lecture (*lectio cursiva*)") and act as respondent and an opponent in disputes directed by masters for Baccalaureate candidates. The practice of the "quodlibetal disputes" (literally: about anything), i.e.

[7] For the faculty of arts in Paris see [42]; for later periods and for universities other than Paris, see [43]. For disputes in the other faculties, see [41] and, for a recent overview [44]. See also [21]. For the disputed and quodlibetal questions in all faculties, see [45]. For a huge collection of disputed questions in law, see [46].

disputes in which the master in theology had to answer a question raised by the public, was a fundamental rite in the acquisition and consolidation of the authority of university masters, beyond academic circles (see [48]).

The disputational and syllogistic modality of teaching and graduating in medieval universities meant that training in logic continued throughout the university curriculum, after graduation in the faculty of arts, in higher faculties, and throughout the careers of masters. Logical skills represented both basic, propaedeutic skills for higher education, and transdisciplinary skills, as a consequence of the general logicization of practices of knowledge and teaching.

6.3 Theories of "Logician Practices"

The way logical skills were theorized depended on the special situation in which users of logic were during the Middle Ages. This special situation rests on the fact that logical practices were, most of the time, what we have proposed to call "logician practices" (see [15]). By this formula, we mean that these practices were based upon a previously gained logical knowledge, and were conducted as a conscious and reflexive application of this training in a series of discursive performances and productions that were themselves logically structured, and whose logical form was socially controlled.

In this way, logic constituted a global framework that shaped and controlled all aspects of rational operations, whether natural or enhanced by logical techniques, applied as a method, theorized as a discipline, part of a social construction, or conceived as a humanizing activity.

6.3.1 The Advent of the "Syllogistic Disputation" and the "Syllogization" of Exegesis

The thirteenth century saw the "syllogization" of the canonical texts on which university teaching was based (Aristotelian corpus, the Bible, etc.) and the advent of a new type of formalized dispute, the "syllogistic disputation." The medieval educational space became thus saturated with full-fledged "logician practices."

Logic offered a codification that governed discursive practices by making available palette of forms to which it was necessary to conform, while the logical forms themselves were all of them perceived as syllogistic in their essence. These practices were full-fledged "logician practices" because the forms were followed in a perfectly transparent, conscious way. This can be ascertained by the fact that they were conspicuously followed, or explicitly referred to. This, in turn, could be done either by means of references to abstract patterns of inference retained in the Middle Ages thanks to the famous mnemonic formulae (Barbara, Celarent, etc.), or, as was

rather the rule, in a metalogical way, by means of metalogical terms. Those included topical and syllogistic concepts, such as "premise," "conclusion," "consequence," "inference," "syllogism," "principle," "middle term," "proof," "demonstration," "topics," "fallacy," etc. but also the metalogical terms that belonged to argumentation in disputes, such as "argument for," "argument against," "solution," "determination," "response to arguments," "opponent," "respondent," etc., all terms that began to appear as "stage directions" in disputational texts during the thirteenth century.

The rediscovery of Aristotle's *Topics* led to the realization that the dialogical practice of argumentation could be ruled by an art, namely the "art of dispute." In the middle of the twelfth century John of Salisbury, in the *Metalogicon*, insists on this great novelty.[8] During previous periods, logic only offered a theory for the *instruments* for dispute; the reading of Book VIII of the *Topics* made available the idea of an art *for the dialogical practice itself*, by offering a set of specifications and a series of processes recommended to the two actors of the debate, adopting the point of view of the "opponent" and that of the "respondent."

The practices of dispute and of the disputed questions, which began to be codified in the thirteenth century, then gradually crystallized into a fixed form, the "university disputation in five points" (question, arguments for, arguments against, solution, response to objections), which was found in all disciplines—arts, medicine, law, theology—where it played the role of a generalized mode of teaching and graduating, as seen above. The term "disputation," instead of "dispute," is meant here to insist on this essential evolution, from a dialogical, informal practice, with real participants, to an institutional, formalized practice, where the opponent and the respondent became logical and institutional instances.

Meanwhile, the disputation was newly described as "syllogistic" in essence during the first decades of the thirteenth century. It was defined as a "syllogistic act" and its products, the disputed questions, would be seen as "syllogistic superstructures." The disputation *in forma*, by which medieval texts meant the disputation that respects both the syllogistic form and the ritual regulations of the university statutes, thus officially received a disputational syllogistic form. The syllogistic definition can be found in many texts. Peter of Spain, in the *Tractatus* (ca. 1230/1240), the most influential logical textbook during the Middle Ages, says that the disputation is a "syllogistic act" ([50], p. 89), while an anonymous commentator (ca 1250/1260) uses the formula: "syllogistic operation" ([51], p. 259). William of Sherwood, an influential master in England, asserts in the *Introductiones in logicam* (ca. 1240) that "the syllogism is the whole essence of the disputation"; he describes the disputation as made up of "several syllogisms" ([52], p. 166).

The syllogistic disputed question in five points becomes the preferred mode of exposition and of argumentation in all disciplines, a scientific literary genre, and a standard textual unit in other types of productions. This is the case with Thomas

[8] "Without this art [i.e. the art of dispute contained in the *Topics*], one does not dispute according to the rules of art, but at random (*nam sine eo non disputatur arte, sed casu*)", [49], p. 131).

Aquinas' *Sum of Theology*, to take a famous example: the *Summa* is just a huge combination of disputed questions following a syllogistic form of disputation. From the mid-thirteenth century on, references to the logical structure of the disputation, through "stage direction," metalogical terms, especially "respondent" and "opponent," and the syllogistic form of the argumentation, are systematically inserted in disputational texts.

The same period witnessed a new logician practice, namely the systematic reconstructions of the syllogistic structures in Aristotle's works.

As is well-known, Aristotle's treatises do not contain a single syllogism, a situation that has caused much ink to flow among Aristotelian scholars (see the debate between Barnes [53] and Lennox [54], pp. 4–6; see also [55]). The absence of syllogisms in Aristotle' texts was an absolute non-problem for late ancient and medieval commentators, who thus displayed a non-formalistic approach to logic, despite their very strong interest in the question of logical form (see [56–58]): syllogisms were just to be reconstructed everywhere they were not explicitly spelled out.

The device had already existed in late antiquity, but it was reintroduced in medieval Latin schools only during the 1230s, as can be seen in the commentary on the *Categories* by a famous master of the time, John Pagus. He offered syllogistic reconstructions, but they are not systematic—nor are they entirely or explicitly expressed in metalogical terms (see, for instance, [59], p. 49, p. 59, pp. 63–65). The syllogistic reconstitution method is then practiced at a very high level, especially in the literal commentaries by Adam of Bockenfield, the great master of arts at the University of Oxford in the 1240s. John Murdoch has rightly emphasized the crucial importance of this element in the history of logic, and even qualified the phenomenon as "excessive". He traces the medieval practice back to the commentaries by the Andalusian philosopher Averroes, discovered in the Latin world from 1225 onward ([60], pp. 4–5). The device is expressed in an explicit and metalogical way right from the beginning of his long commentary on Aristotle's *De anima*, where he states that a sentence of Aristotle is "in the form of a categorical syllogism" ([61], p. 4). We find similar examples in Robert Grosseteste's commentary on the *Posterior Analytics* (Oxford, ca. 1220), with metalogical terms such as "medium term," "major," "minor," and "conclusion." We also find "pro-syllogism" ([62], for example p. 109), when the syllogism that establishes one premise of a given syllogism is in turn made explicit. Syllogistic reconstructions are also found in Paris, in the commentaries on Aristotle's logical texts by Robert Kilwardby (1237–1245).

When applied to logical texts, this method means that Aristotle's logic is itself logically, recursively reconstructed.

6.3.2 Logical Skills and "Logician Practices"

Combined with the formalization of dispute, the appearance of systematic metalogical reconstructions of the syllogistic structures implied in Aristotle's work marks a crucial stage in the definition of syllogistic as the underlying logic of sciences,

including logic itself as a science. It also has deep consequences on the intellectual and social function of logic as the norm of thought, and on the definition of logical skills thereby mobilized.

Through this twofold evolution, probably stabilized and generalized from the middle of the thirteenth century onward, the two main forms of academic practices of knowledge, the *lectio* and the *disputatio*, changed dramatically. From logical practices in the broad sense (semantic and logical analysis of texts, rational and sometimes contradictory organization of arguments, etc.), as they were still during the twelfth century, they become fully "logician practices," logically skilled practices. Logical skills were also socially distributed: in the ritualized organization of university disputations, the "respondent" and the "opponent" corresponded to socially, statutorily defined roles (undergraduate student, bachelor, master); two different types of classes were distributed to different actors: the basic "cursive lecture (*lectio cursiva*)," which was conducted by means of literal explanations of texts, and thus based on syllogistic reconstructions, was often entrusted to bachelors, while the prestigious "ordinary lecture (*lectio ordinaria*)," generally conducted though disputed questions, was performed by the master.

The discipline of logic, with its arsenal of pre-established forms, was thus not only the norm of argumentative and exegetical practices, but their immanent form, immediately recognizable in texts and practices that actually followed a compulsory syllogistic form.

The presence in our texts of systematically followed syllogistic forms, as well as of metalogical terms, makes us think we can safely consider these practices as reflexively thought of and logically performed by the actors themselves. Logician practices, even if they were carried out to varying degrees, were probably a massive phenomenon among masters and students in medieval schools, contrary to what Olga Weijers has suggested. After having stated that "everyone learned grammar and logic (and sometimes rhetoric) before moving on to other disciplines," she has suggested that the use of logical instruments such as topics was "essentially implicit and often unconscious," in the same way as today a frequent, but unconscious use is made of the "*locus a simili*" ([63], p. 401). The disappearance of systematic, formally taught logic classes from secondary and higher education could indeed explain today's lack of logical reflection on many occasions, but this situation is in plain contrast to what was standard education during the Middle Ages. This is characterized by a pervasiveness of logical skills as well as an awareness of the intellectual and social normativity of logic.

The cognitive function of logic is applied and reinforced by the fact that the intellectual productions logic was supposed to govern were originally designed and socially controlled by following a logical form. Logical skills preside over the formalization of the intellectual and scholastic practices and are even projected onto the formation of the canonical texts that were the basis of medieval culture. This created a situation of "transparency" for the logical form (see [64]), which gives the normative character of logic an immediate and powerful foundation.[9]

[9] John MacFarlane criticizes this notion on the basis of the difficulties raised by the notion of logical form in today's philosophy of logic. But it applies just quite well to the thirteenth-century situation, when what was the form of an argument was its substantial form, which various modes and

6.3.3 *Theories of Logic*

In medieval philosophy of logic, logic was considered both as a natural disposition—it was then called "natural logic (*logica naturalis*)"—and as a discipline—it was then called "artificial logic (*logica artificialis*)." It was also considered a science, like any other university discipline. Even in this case, because of the ancient and medieval definition of science, logic remained a disposition of the subject who possesses scientific knowledge, i.e. a "habitus." Science was indeed defined, following Aristotle, as the "habitus of the conclusion"—we could add, for greater clarity, "as a conclusion," and not just as a proposition.

The science of logic is not, however, a habitus like any other, since the possession of this habitus is the driving force behind the acquisition of all other scientific habitus. Because of its ruling function with regard to other fields of knowledge, logic is both a "science," like any other discipline, and an "art," i.e. a technique, a method of knowledge for all sciences, including itself. At the end of the thirteenth century, Radulphus Brito, an important master at the faculty of arts in Paris, described logic as an "acquired habitus" based on "natural [syllogistic] habitus" ([66], p. 16). Logic was for Radulphus defined as a scientific habitus directed to the instruments of knowledge that are the objects of logic, while the objects of logic were defined as methods of knowing, which are instruments for other sciences:

> The subject,[10] in logic, is the method of knowing (*modus sciendi*[11]) as an instrument of knowledge, by which each of us knows (*scit*) what he knows; the instruments include definition, division and demonstration. I say "as an instrument of knowledge" because the "mode of knowledge" can mean, in another sense, **the acquired disposition (*habitus*) of these very instruments of knowledge which is logic** ([67], p. 303).

Logic is defined from the thirteenth century onward as the "discipline of the disciplines," according to a formula taken from Augustine, but also as the "art of the arts," and the "science of the sciences." These two formulas, initially (falsely) ascribed to Augustine, began to be read at the turn of the twelfth and thirteenth centuries, and were then found in a great many thirteenth-century texts. We find the definition of logic as the "art of the arts," for instance, in one version of the Peter of Spain's *Tractatus* ([50], p. 1); in the work of Robert Kilwardby ([68], p. 147, pp. 157–158, p. 218), one of the most influential masters of the thirteenth century; and in the commentary by Thomas Aquinas on the *Posterior Analytics* ([69], pp. 3–4).

Significantly, when characterized as "the art of the arts," logic appropriated a definition that was originally used for philosophy in late Antiquity (in Ammonius, Philoponus, Elias, David, Eustratus of Nicaea, Damascus, or Macrobius), according to a tradition also transmitted to the Middle Ages by Cassiodorus and taken up by

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figures were authoritatively listed by the *Prior Analytics*. On logical norms in the Middle Ages see also [65].

[10] *Subiectum*: in the Middle Ages, what is called the "subject" of a science corresponds to what we call the "object" of a science.

[11] The Latin verb *scire* refers more specifically to a type of knowledge, i.e. scientific knowledge.

Hugues of Saint Victor ([70], 1989, p. 23), in the *Didascalico*n, a text widely read in the Middle Ages.

An absolute necessity was attached to the acquisition of the discipline of logic. Natural logical abilities would not be enough until they had been stabilized in an art, i.e. in an artificial logic, itself to be acquired through a formal teaching. The possession of disputational and deductive skills was necessary. Logic was thus described as "useful and necessary" by Albert the Great in a very influential text on logic. Logical skills are "useful" to other sciences, and even "necessary" for the acquisition of any scientific knowledge, since the latter presupposes a knowledge about what is knowledge; they are even "useful" for reaching human felicity:

> Because science is the **habitus of the conclusion**, **one has to know how to draw a conclusion, if he is to acquire some piece of science** […] One does not how to draw a conclusion unless he knows from what, in which way and **from which combination** (***complexio*** [= syllogistic combination]) he is to draw a conclusion. **And all this is taught only by logic**.
>
> As a consequence, logic is not **only useful and helpful for other sciences, but it is also necessary**. This is the reason why **those who don't know logic, even if they seem to know something, do not know that they know** (*nesciunt se scire*), because they do not know how each thing must be known, and how it must be proven **or disproven** (*probandum vel improbabdum*); […] they do not know **why they assent** to this particular piece of knowledge, or **what is to be opposed** to someone who would contradict it (*qualiter contradicendis responderi debeat*). This is what the logician knows…
>
> The one who does not know logic, even if he seems to know something, does not **know the reason of his knowledge,** and he enjoys the same relation to it and to his act of knowing **as the fire to the act of burning the wood** […] The one who didn't not acquire the knowledge of the rules and principles of logic does not know how to explain the reason of his knowledge, […] and **he will be as the illiterate (*idiota*) in front of a text**.
>
> […]
>
> This science [i.e. logic] is not only necessary, but also useful. If what is good and what is the **felicity** for man is **the most achieved act** according to the best part of the man's soul, that is the **speculative intellect** … it is obvious that this science **[i.e. logic] is useful above all for the attainment of felicity** […] This science is thus to be desired above all things ([71], p. 5, 31–36, 26).

Because it conducts the acts of reason while theorizing them, logic is thus both an art of self-government for reason, and a science of logical objects once the latter have been isolated in a theoretical perspective.

Logic is a science when it isolates and targets the instruments of knowledge used in other sciences and sees them as logical concepts: it is then a *logica docens*, logic as a discipline taught in schools. It is an art when it guides, with the help of these instruments, theoretical practices. In this case, it is a *logica utens*, the logical knowledge immanent to scientific discourses, which guarantees their scientific essence. This mode does not only concern, as we would think, following a modern pattern, the systematic, demonstrative bringing into coherence of pieces of knowledge,

according to a logic of justification, called *iudicium* in the Latin tradition. It also concerns the acquisition of knowledge, according to a logic of discovery (*inventio*): this is the reason why many authors, following Avicenna, defined logic as "the art of making what was unknown into something that is known" (from what was already known).

All these aspects of logic are highly coherent in the context of "logician practices." *Logica utens* cannot consist of following a logical procedure spontaneously or thoughtlessly, but must consist of the conscious implementation of logical knowledge previously acquired thanks to the discipline of logic (*logica docens*). Artificial logic is conceived as the necessary enhancement of natural logic, which is judged fundamentally insufficient in guaranteeing a stable form of knowledge. Scientific knowledge requires that in order for one to know that X is the case, one must know what it is to know that X is the case, i.e. he must have a theory of knowledge and truth; but one must also know how to show that non-X is not the case; in order to be able to conduct a contradictory disputation establishing the truth of X, one must be able to conduct the refutation of non-X.

The scholarly practice of truth is thus based on an art of disputation that guarantees the contradictory, formalized, collective, and socialized establishment of truth in a series of ritualized academic acts.

The skills properly conferred by logic, in the same manner as grammar, displayed a powerful recursive dimension: logic is taught and learned in a logical way. Like grammar, which recursively governs the faculty of language, logic recursively governs rationality. In the *De ortu scientiarum*, Robert Kilwardby shows how the self-reduction of natural reasoning to the art of logic is a foundational moment for human reason, which makes the creation of all the other arts possible ([68], p. 147). He offers an almost hallucinatory description of the recursive and "self-methodological" dimensions of logic:

> Man reasons *(ratiocinatur*) thanks to his reason (*ratio*), reason [reasons] thanks to the faculty of reasoning (*ratiocinatio*) […] but **the faculty of reasoning reasons thanks to itself**. In the same manner, the reasoning conducted in particular sciences is **done thanks to the doctrine of reasoning (*doctrina ratiocinandi*), that is to say by logic,** that is common to all of them [i.e. to all sciences], at least according to the use made of it. The doctrine of reasoning that has been discovered by reasoning has been reasoned *(ratiocinata est*), but **the doctrine of reasoning that has been reasoned has been reasoned by itself.** In this way, logic is said to be "one unity", "a divided division" and "universal universality" ([68], p. 160).

6.3.4 Anthropology of Logic

As the above-quoted text by Albert the Great suggests, far from providing a simple "training" in an ordinary, modern sense of the term, the acquisition of logical skills was thought of as a self-fashioning, humanizing activity, for a humanity essentially defined by the life of the intellect.

This idea of an anthropological perfection through logic is based upon a definition of logic as a "rational science" and as a technique of the intellect, upon the distinction between natural logic and artificial logic, and, eventually, upon the rejection of any form of autodidactic knowledge. This series of new ideas was present in the Arabic philosophy of logic, whose influence, already felt in the twelfth century, spread widely during the thirteenth century, according to an original, Latin synthesis of the various doctrines professed by Alfarabi, Avicenna, Averroes, and Alghazali. Part of this inheritance was in accordance with the valorization of the "reduction in art" carried by the Latin tradition from the twelfth century (Hunt 1980); it also conflated with an influential twelfth-century theory that saw in the acquisition of liberal arts a reparation for the damage caused in the soul by original sin (while the mechanical arts would mend the damages of the body, see [70], pp. 12–17). Within this framework, logic, as the "art of the arts," was seen as the key for the perfection of a "possible intellect" that was described, following Aristotle, as a *tabula rasa*, a faculty that one can actualize for himself only by performing intellectual operations.[12]

A commentary on Peter of Spain's *Tractatus*, dated from the 1280s and attributed to a famous master from the Parisian faculty of arts, Simon de Faversham, displays some radical anthropological theses. A strong praise of logic, inspired by Albert the Great (as can be seen in the text previously quoted), is turned into an "exhortation to logic." Natural logic is clearly judged insufficient. The argument is meant to reject whole human groups, all those who have not received a logical education, to the margins of humanity, by describing them as "useless beasts, called 'men' in a homonymous sense." This description recycles a famous, often-quoted formula, originally designed by Averroes not for men who are devoid of logic, but for men who would be incapable of being perfected by speculative knowledge.[13]

Logic here substitutes for philosophy in the definition of an anthropological ideal, and reasoning prevails over intellection in the definition of the operation that is proper to Man:

> The proper operation of man is that by which man receives his ultimate specific difference. **The ultimate specific difference of man is reasoning**, thus [the proper operation of man] is reasoning.
>
> […]
>
> Since man is one among natural beings, he has his own proper operation. And this operation is reasoning (*ratiocinari*). As a consequence, when he can perform this operation, that is

[12] On the whole topic, too complex to be discussed here in detail, see [15], chapter 6.

[13] "It must be said that … what it is to be a man according to **his ultimate perfection** and his **perfect substance** is **being perfected by speculative** science, and this disposition is felicity and everlasting life for him […] It is obvious that the predication of the name 'man' said of the one perfected by the speculative science and of the one that is not, **that is the one who doesn't have such ability that he could be perfected**, is **homonymous,** in the same way as the name 'man' said of the alive man and the dead man, or of the rational [being] and the one in stone" ([72], f. 1v. H-I). For this Averroist, elistist anthropological theory, see [73].

> reasoning, he is called a man, and when he cannot, he is only called "man" in a homonymous way.
>
> […]
>
> Since the act of reasoning is the operation proper to human being, man is ordinated to the act of reasoning as his own end. And the one to whom the act of reasoning does not belong is said to be worthless (***inutilis***) and a beast (***bestia***).
>
> And three things are then made clear: **the man to whom the act of reasoning doesn't belong is not said to be a man except in a homonymous way, that he is worthless, and that he is a beast**.
>
> And because this operation, that is **reasoning, can not belong to us except by way of logic, logic is to be pursued by all means (*maxime*)**.
>
> But you will immediately object: isn't it the case that all men do naturally (*naturaliter*) reason? I reply: **although all men naturally reason, nevertheless no one can reason perfectly without logic.** The notion that the act of reasoning perfectly belongs to us thanks to logic is made clear according to Alfarabi's authority. He says that in the same manner as grammar is ruling (*directiva est*) language and speech in order to prevent one from erring (*erret*) in interpreting, **logic is ruling our reason lest it might err** in reasoning. Consequently, man reasons correctly (*recte*) and perfectly thanks to logic. This is made clear by the etymology of the word "logic".
>
> All what have been said above shows that **man without logic is not a man except in an homonymous way.**
>
> And Albert [the Great] exhorts us to logic [see text quoted above] saying […] that the other sciences [that is: when conducted without logic] are to logic what **is the uneducated man (*idiota*) to the learned man (*sapiens*).** The uneducated man doesn't even know he is erring, and he is unable to correct other people. This is the reason why Albert says that he who knows sciences other than logic knows without knowing he is knowing in the same manner as the **fire that is burning** doesn't know it is burning ([74], pp. 77–78).

Far from being an isolated case, despite a particularly radical argument, this text goes along with dozens of other university productions from the second half of the thirteenth century. They offer strong praises of logic, make the absence of logical education an obstacle to a philosophical life—i.e. to the full realization of the human essence—and describe beings deprived of logic as belonging to inferior forms of humanity.

These ideas are particularly well illustrated in the works of Albert the Great. In his commentary on the *De anima*, he calls the natural logic which everyone can develop a "proximate unarranged potentiality" to the acquisition of science, while the "remote unarranged potentiality" is the stage of absolute ignorance displayed by babies. The real difference comes with the "transformation (*mutatio*)" that consists in transitioning from this stage of natural logic to the one characterized by the habitus of science ([75], pp. 98–100). In his commentary to the *Topics*, he states that the child (*puer*) cannot be called strictly speaking "ignorant" since it is not even "capa-

ble of learning," in the same manner as "inanimate objects (*inanimata, sic!*)" ([76], p. 465A/B). In the commentary to the *Politics*, he says that the definition of man as a being "capable of learning" is designed to exclude "mentally deficient (*moriones*)" being, who do not enjoy a use of reason ([77], p. 709B). In his *Sum of theology*, when dealing with the topic of the typologies of ignorance and the "invincible ignorance," he says that natural logical skills are developed by every human being provided he is not disabled, either in a permanent way, such as mentally deficient people (*moriones*), mad people (*insani*), melancholic people, people injured at the head, or in a non-permanent way, such as drunken people or people driven mad with anger ([78], p. 160B). A similar typology of ignorance is found in the paraphrase on the *Sophistici Elenchi* ([79], p. 373B). In the *De intellectu et intelligibili*, a typology of the intellects also includes a scale of logical skills, from the divinized philosophers to intellectually deficient people (*moriones*), uneducated people (*idiota*) or men living as pigs ([80], pp. 501b-502a; p. 513b).

At the bottom of the category of "logically disabled people," one can eventually find naturally intellectually deficient creatures, the pygmies. In his zoological tract, the *De animalibus*, pygmies are for Albert "super apes," which are nevertheless decidedly not human because of their deficient natural logic. Their "shadowy reason" does not allow them to develop the lowest levels of argumentation, namely rhetorical and poetical reasoning, those used even by people belonging to the lower layers of human society:

> **The pygmy only performs the first act [*i.e.* they process basic sensory information, without forming a concept]**. This is why it has only a shadow of reason, since the light (*lumen*) of reason wholly consists in the second [act] […] As a consequence, the pygmy perceives nothing of the essence of things and **it has never grasped any argumentative relationship**. Its speech is like the speech of those who are **mentally deficient (*moriones*)** … But there is a difference since **the pygmy is naturally deprived of reason, whereas the other is accidentally deprived, because of melancholia or something else, [and he is deprived] not of reason, but of the use of reason** ([81], p. 1323).

> For the same reason, **it uses neither rhetorical nor even poetical arguments by way of persuasion, which are the most imperfect arguments** of all ([81], p. 1328).

Albert the Great, whose influence on thirteenth-century thought cannot be undervalued, thus constructed a "logical scale for humanity," from "pygmies" to "philosophers," where the overvaluing of logical skills gained by formal learning has its counterpart in the stigmatization of "logically disabled" people, endowed with a faltering humanity.

6.4 Social Uses of Logic

6.4.1 Usefulness, Value, Instrumentality

In the context of medieval culture, where "science for the sake of science'" did not exist anymore than "art for the sake of art," we must seriously consider that logic was valued because it was useful. The usefulness of logic certainly applies even

when its instrumentality, that is to say its direct use in the social practices with which it was associated, is not always easy to ascertain for the historian. There are indeed many cases where a skill is actually useful without having a specific function; this is typically the case for skills implied in "general culture," to which medieval liberal education is often compared.

The question of the usefulness and social value of logic in the Middle Ages raises rather complex methodological issues. In addition to the above-mentioned distinction between usefulness and instrumentality, it should be recalled that the question of a skill is clearly distinct from that of a university degree. Moreover, value, usefulness, and instrumentality do not necessarily go hand in hand. The fact that a skill is required or recommended in order to access a social function or an academic program does not automatically mean that such a skill is actually implied in the performance of the corresponding tasks. This is illustrated, for example, by the selection of students according to their marks in mathematics, today observed in some countries such as France, for a whole range of study and occupations where mathematics is of no use. Eventually, the idea that logical skills would be used for selection purposes, in the same manner as IQ tests today, is to be discarded for the Middle Ages: the pool from which future elites could be drawn was not so large that a concern with selection could play a role in valuing or imposing basic logical education.

6.4.2 Studies, Degrees, and Skills

The direct intellectual and academic usefulness of logic is obvious in the case of students pursuing higher education. However, as far as university degrees are concerned, studies by Jacques Verger on the academic uses of the Master of Arts degree [82, 83] have long questioned the idea that the study of arts would have really functioned as a propaedeutic for higher faculties, because of the partial disarticulation of the two curricula. Contrary to a fairly common assertion in scholarship, studies or degrees in arts were not mandatory to move to higher faculties. In addition, the proportion of students moving from arts studies to higher faculties was indeed very small. The conclusions offered by Jacques Verger about the direct usefulness of a degree, the Master of Arts, in higher faculties, are negative overall.

A large majority of medieval university students were BA candidates, "dropouts" and other "intermittent students," who attended the faculty of arts for only a few years and left university without a degree, and without ever having intended to obtain one. Because the education received in those few years was mainly a logical (and a grammatical) one, we have proposed to describe these student populations, who represented at least 50% of the students in arts (see [82], [84], p. 196), as "logician student populations." Knowing that the faculty of arts brought together around 80% of the entire University in Paris (and in other universities organized according to the Parisian model), some of what we can learn from studies in the social history of university students could thus be applied to students who were mainly trained in logic (and in grammar). These "logician student populations," once the students who

belonged to the secular clergy set apart, were made up of young men who would find various jobs in society. Not graduating, which was probably a choice, and not a "school failure" as we would spontaneously call it today, clearly did not prevent the study of arts from remaining attractive, since hundreds of North European students converged each year in Paris, despite the high social and material costs of such an enterprise. The "logician student populations" correspond to two categories in Schwinges' classification, namely the "student" in arts and the "bachelor" in arts: they are the most numerous, and those with the lowest social background ([84], p. 195 ff.).

From the point of view of skills, however, the same Jacques Verger has insisted on the fact that skills in arts, first and foremost logical skills, were necessary for all university disciplines, including law [82, 83]. The previous sections of this paper have already evoked university logical practices and enlightened the obvious usefulness of logical skills in the academic world.

In the mendicant context, the usefulness conferred on logical skills is demonstrated, as seen, by the choice made by the Mendicants to create, as early as the mid-thirteenth century, a network of specialized logic schools (*studia artium*). This original and fully-embraced politics of logical education had nothing to do with a norm that would have been imposed by university regulations. Schools of logic were generally attended by future students in theology, a great majority of whom were destined for the "Lectorate" program, and thus not concerned with university degrees. The small group of those who were meant to become masters in theology did not need a degree in arts, since such obligation did not exist in Paris (a least before 1598, see [85], p. 131). On the contrary, as seen above, the prerequisite of a previous education in logic, and then in philosophy, was formulated as early as 1305, as an internal regulation, by the Dominicans.

A larger social usefulness of logical skills can be deduced from the fact that mendicant schools of logic were frequented by a significant portion of "common friars" (*fratres communes*), that is to say by friars dedicated to pastoral duties, who were not supposed to follow a program of higher studies in philosophy and theology (as opposed to future readers and theologians). This idea is suggested by educational theories formulated by some major leaders of the Dominican order, such as Humbert of Romans (see [29]). It is confirmed by statistics. The figures of the Province of Spain are especially impressive, but equivalent data are found for other provinces (especially Provence and Rome). Logic schools are always two to three times more numerous than schools dedicated to philosophy in the Province of Spain (see [25], p. 12), while the latter, not the former, were always associated with higher theological studies. About one hundred students were present in the schools of logic each year. Since the program of logic lasted 3 years, this means, at the very least, that more than three hundred Spanish friars were trained in logic over a period of 10 years, for a province which, in all, boasted only 43 convents for the year 1299. During the same year, no less than 21 schools of logic were created, which means a ratio of one school of logic for every two convents. If we take into account the average figures for the end of the thirteenth century, we would then number seven to ten logicians per convent (statistics established from [86]). These cohorts could not

have been entirely absorbed by the elite groups of friars meant to be further trained in advanced theology and to act as future leaders of the Order. It is therefore highly likely that a specialized logical training was followed by friars who then went back to their convent in order to carry out their pastoral duties (for more detail, see [29]). Logical skills must have been considered to have a pastoral usefulness.

With regard to the secular clergy, a recent study dedicated to a representative sample of members of the English parish clergy during the first half of the fourteenth century shows that the benefited clergy sent to study went almost exclusively to Oxford (90–95% of them). 75% of them joined the faculty of arts ([87], pp. 75–77), where a "Parisian logical model" of education was standard. They attended university intermittently over a few years, without graduating (only 5% received a Master of Arts degree): it is thus very likely that most of the university training they received was grammatical and logical in essence. Among the general benefits received from attending university, "Latin classes on logic and other subjects" are mentioned ([87], p. 28). The results of this study, which indirectly demonstrates the usefulness conferred on studies in logic by ecclesiastical hierarchies, do apply to earlier periods (namely the thirteenth century) and to other dioceses in England, and are probably valid in other contexts, including Paris. This clerical orientation of studies in arts might even partially explain the very implementation of the "Parisian logical model" by religious authorities during the formative years of the university of Paris, a model based upon the exclusion of disciplines seen as useless or dangerous (such as some "literary" disciplines, sciences, and natural philosophy, see [15], chapter 3).

6.4.3 What to Do with Logic? General Culture and Pastoral Care

The previous sections have established the social usefulness of logic, be it real or represented, but they have not yet disclosed the content of that usefulness.

One general pedagogical benefit connected to logic could be a "disciplinary" one, in the same way as for grammar (see [88]): a function of coercion, hence the etymology, widely evoked at the time, of "ars" from "arto," to tighten, with the idea of being socially (and sometimes physically) constrained by rules and principles (*artatur regulis et maximis*). Early in life, at 12 years-old, or even before, one would learn that he has to think by obeying to rules, in the same manner as he has to speak and write (Latin) by obeying to rules.

One can also think in terms of general training, of structuring the mind and of developing abstraction abilities, all notions often evoked for mathematics today, and which could also be applied to medieval logic, associated with a function of standardization of discursive and intellectual activities.

Generally speaking, for intellectual and religious elites outside the academic world, whether employed in civil and religious administrations or dedicated to pastoral duties, we can identify an indirect use for logical skills. Logical education

could provide a general scholastic culture, where the acquisition of a logical and grammatical language was completed by the manipulation of some basic philosophical concepts during logic classes, such as "substance," "accident," "matter," "form," "potentiality," "act," etc. Logic would teach general rational skills, focusing on the notions of distinction, division, classification, hierarchy, organization of arguments, understanding of a rule in its generality, location of the particular case under the general rule, etc.

This logical culture was as necessary as the acquisition of Latin, which still remained, despite the development of intellectual practices in vernacular languages, the main vehicle of the intellectual and legal life at this period. Both linguistic and logical skills were involved in the mastery of the Latin of schools, the "scholastic" Latin, a *sine qua non* for the exercise of the social functions reserved for learned elites. For young students who left the faculty of arts without a degree, this training was probably useful for making their way in civil society. It enabled them to obtain the same jobs as those who were Masters in arts, namely secretarial work and teaching, but at a lower level ([89], p. 111).

Neither the guides for preaching (see [90]), nor the guides for confession (see [91, 92]), promoted in the new thirteenth-century pastoral practices, followed an obvious logical structure. It is likely, however, that minimal logical skills were considered necessary to understand the theological subtleties underlying them, as well as providing useful argumentative tools. For the judgment of penitence performed by the priest during confession, it is possible that logical skills could have been of some use, with the "personalization" of confessional practices. This meant that a new stress was put on the "judgment" (*discretio*) of the priest: it required knowing how to judge individual actions and circumstances, and how to locate them in a pre-established hierarchy of sins. The "ordering" of one's own guilty conscience was also required from the penitent himself during the annual confession, probably without much success (see [93]).

The pastoral value of logic is suggested by the fact that the formula that was used to characterize logic at the beginning of the thirteenth century, that is the "art of the arts," did not only represent a logical appropriation of a definition that originally belonged to philosophy: pastoral care, the cure of souls itself, had been defined as the "art of the arts" by Gregory the Great ([94], col. 14A). The formula was very well-known, as it was present in the Fourth Lateran Council in 1215, in the very same passage that affirmed the need for the bishop to vigorously promote the education of the clergy, a requirement that is generally considered as an important element in the history of the early developments of the University of Paris. We find it in the Canon Law (*Liber Extra*), as well as in famous sermons, for instance, in one by Robert of Sorbon, the founder of the College of Sorbonne (see [90], p. 122, note 182). The confluence between logic and pastoral care in the very same definition can be connected to the fact that logic, although Aristotelian, had long been "assimilated" as "Christian" and "Latin," and labeled "useful and harmless," according to a model that was probably transferred from grammar to logic over time. As can be

seen, for instance, in the 1213 Council of Paris ([17], p. 77), or in some earlier texts from the Canon Law (see [95]), logic was included, together with grammar, in the *trivium* disciplines which were canonically permitted, or even prescribed for the education of the clergy, while all other secular sciences, especially the "foreign" (or even "adulterous") natural philosophy transmitted by Greeks and Arabs, were long suspected of heresy.

6.5 Conclusion

The thirteenth century represents a golden age in the history of logic. Logical skills were highly valued among medieval elites, even outside universities and schools; they were endowed with an elitist anthropological significance. The discipline of logic occupied a great proportion of time in the teaching of arts, it was based on a canonical corpus that was still undisputed, the Aristotelian *Organon*, and it was defined as a science as much as an art (a technique). Logic presented a transdisciplinary skill and a universal method; it regulated practices of knowledge and guided some of the intellectual activities that were by then formalized, beyond academic circles.

The period saw the first signs of decline when logic, increasingly incorporated and trivialized, became a victim of its own success. The first doubts about the absolute necessity of the discipline of logic emerged; it was more frequently defined as know-how, practical discipline, and considered as only ancillary to other disciplines. This evolution can be read in the philosophy of logic developed by two very influent masters from the end of the thirteenth century, the Augustinian theologian Giles of Rome, and the university master Radulphus Brito (see [96, 97]). The isomorphism seen between the Aristotelian logic and the necessary forms of our thought, together with the strong belief in the Aristotelian notion of science, had been foundational in the remarkable intellectual and social rise of logic during the thirteenth century: both began to dissolve as the golden age of Aristotelian syllogistics faded away. Epistemological optimism declined after Radulphus Brito, during the first decades of the fourteenth century (See [98, 99]). English logic, the very logic that Humanism would describe as "barbarous" (see [100]), offered a general theory of consequences where syllogisms were just one restricted, marginal type of formal inference. Logic, under different forms and modalities, would nevertheless continue enjoying a successful academic career for a long time to come, with the development of universities and colleges all over Europe, and their implementation elsewhere, in the world of colonial Aristotelianism. It will continue to serve as a reference for various normative practices of rationality, education, and discrimination.[14]

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Chapter 7
Anti-dialecticians in the Middle Ages: Historiographic Myth or Reality?

Dominique Poirel

Abstract At the beginning of the twentieth century, the historiographical category of "anti-dialecticians" has been devised to describe a group of eleventh-century monastic writers such as Otloh of Sankt Emmeram, Lanfranc of Pavia and Peter Damian, and Manegold of Lautenbach. They made their names by opposing dialecticians, or a certain way of approaching theological questions through dialectics, or ancient philosophers. Three questions are posed: (1) Do the authors involved form a homogeneous group? (2) What is the nature of their opposition to dialectic? (3) Is their opposition to dialectic compensated by the use of alternative forms of rationality? Although the four authors have in common to support the Gregorian Reform, they show diverse attitudes and address different issues. The category of "anti-dialecticians" is therefore to be seen as the result of an amalgam, which can be explained by a determinate historical seedbed (Kulturkampf in Germany, anticlericalism in France). Part of the conflicts can indeed be explained as a growth crisis. The progressive advent of a science of faith, which would later on, during the twelfth century, be called "theology", gave rise to a rivalry between two social groups, monks and secular masters, while the so-called anti-dialecticians were also eager to show that a science of the Christian faith cannot be reduced to a philosophical discussion. This series of disputes have prepared the distinction of two autonomous sciences: theology on the one hand, philosophy on the other. In this sense, the so-called anti-dialecticians teach us about the split between two logics, rather than a simple rejection of logic.

Keywords Logic · Dialectic · Rationality · Faith · Theology · Philosophy · Monasticism · Schools

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7.1 Introduction

In the years 1050–1085 CE the small world of the literate in the west was rocked by a series of theological controversies [1–3]. Particular to these debates was that, in addition to the doctrinal issues with which they were primarily concerned, they generally had a secondary focus on the use, place and value of logic about God. Is it legitimate to subject God to the rules of human language and reasoning? If the answer is yes, then transcendence, that quintessential characteristic of God, is apparently set aside, leaving the pertinence of assertions and validity of conclusions concerning him open to challenge. If the answer is no, then reason, which is what makes man in God's image, is apparently unable to perform its most noble mission, which is to understand the realities of heaven. Those who belittle human reason are open to the accusation that, in scorning God's creature, far from glorifying the creator, they insult him.

It was the German historian Joseph Anton Endres (1863–1924) who devised the historiographical category of "anti-dialecticians" to describe a group of monastic writers—such as Otloh of Sankt Emmeram, Lanfranc of Pavia and Peter Damian, to whom is sometimes added the Augustinian canon Manegold of Lautenbach—who made their names in the early decades of our period of interest by opposing a particular dialectician, or dialecticians in general, or a certain way of approaching theological questions through dialectics [4–7]. In 1902 Endres observed that, even before the "problem of universals"—regarded since the early nineteenth century as the great philosophical debate of the Middle Ages—there had been a great debate between "dialecticians" and "anti-dialecticians" concerning the application of logic to matters of Christian faith. The subsequent intellectual histories since have treated together this small group of authors.[1] Recently again, Thierry Lesieur has sought to show that Lanfranc, Peter and Otloh were representatives of an alternative form of rationality to that of logicians, based on the opposition of contraries and its resolution in harmony, following a cognitive model inspired by music and particularly by monastic psalmody [10]. In the present discussion, I should like to test this historiographical category of "anti-dialecticians", by posing the following questions:

1. Do the authors involved form a homogeneous group and, if not, is there any reason to maintain the appellation "anti-dialecticians"? This question is inseparable from two others, more closely linked to the theme of this conference:

[1] For instance [8], p. 160: 87: "Anti-dialecticiens. […] Ces excès appelèrent une réaction, et le XIe siècle vit surgir un groupe de théologiens qui, à des degrés divers, se retournèrent contre la dialectique et la philosophie, coupable à leurs yeux de tant d'égarements. Ils ne veulent d'autre méthode théologique que l'interprétation littérale des Écritures. Ce mouvement d'opposition se rattache à une tentative de réforme monastique, réalisée dans des abbayes bénédictines de France et d'Allemagne. Les personnalités les plus remarquables de ce groupe appartiennent au XIe siècle: en Hongrie, Gérard de Czanad; en Italie, Pierre Damiani; en Allemagne, Manegold de Lautenbach et Otloh de S. Emmeram". One of the first not to take for granted the existence of this category of "anti-dialecticians" is Alain de Libera, for instance in [9].

2. What is the nature of their opposition to dialectic? Are our authors opposed to the discipline itself, or to its extension to questions regarded as beyond its scope, or simply to errors or clumsiness in its application?
3. Is their opposition to dialectic compensated by the use of alternative forms of rationality, such as analogical, symbolic or mystical thinking?

7.2 Who Are the "Anti-dialecticians"?

We shall start by introducing our "anti-dialecticians"; I shall then discuss the homogeneity of this group, its opposition to dialectic and its adoption of alternative logics, ending with a few more general conclusions relating to the subject that concerns us here. So first of all, who are the anti-dialecticians?

7.2.1 Berengar of Tours/Lanfranc of Pavia, c. 1050

The first debate in which one of the above came to prominence erupted in the mid-eleventh century in relation to the Eucharist [11, 12]. Does consecration transform the substance of the bread and wine into the Body and Blood of Christ, which are thus truly present, or do the bread and wine remain unchanged in substance, with the addition of what is called an "intellectual" or "figurative" presence? This dispute was initiated by Berengar of Tours (d. 1088), an eminent master of the liberal arts, chancellor to the bishop and head of the cathedral schools in Tours [13]. In late 1049 Berengar sent a challenge to the most celebrated of his colleagues, the Italian monk Lanfranc, prior of Bec-Helloin and head of the abbey's schools. He invited him to a kind of theological joust in which, after debating in public before competent judges, one of the discussants, either Lanfranc or Berengar, would be recognised as the winner. But things did not go to plan. The challenge letter caused a scandal and Berengar was summoned to a council in Rome. His thesis was condemned on several occasions and he was forbidden to teach on the Eucharist. However, this did not stop him writing treatise after treatise to defend his position against that of Lanfranc.

The texts that have been preserved show that the debate between the two involved a fascinating swap of methods. Each moved onto his opponent's terrain in order to crush him more completely. Having declared that he regarded arguments from authority as preferable in theology to dialectical reasoning, Lanfranc agrees to go down on the field of dialectic in order to demolish Berengar. His way of arguing, he says, is flawed and he commits errors against both the faith and logic [14]. Not to be outdone, Berengar takes up his opponent's preferred weapon of authorities, citing the words of Christ and the writings of Augustine to prove that anyone who rejects dialectic rejects reason itself, and so denies the image of God in himself ([13] pp. 85–87, lin. 1774–1842). Lanfranc, therefore, does not reject dialectic, neither in general nor about God, but in the second case he prefers other modes of discussion.

7.2.2 *Peter Damian/Desiderius of Montecassino, c. 1067*

The next dispute focused on divine omnipotence. The starting point was some words of St Jerome's in a letter to his young friend Eustochium in Rome, who had decided to be a consecrated virgin. Jerome exhorts her to remain faithful to her vow, saying "I say it boldly; though God can do all things, he cannot raise up a virgin once she has fallen".[2] Although the authority here was a Church Father, and despite his struggles as a reformer to promote religious life, Peter rebels against these words. How can any occurrence be presented as a limit to divine omnipotence? In this case, the all-powerful God could either erase the sin of such a fall through his mercy, or he could restore the physical virginity through a miracle ([16] = PL 145, col. 595–622, espec. p. 402–406 = col. 600C-601B).

But, his contradictor insisted, even allowing for the possibility of a miracle, there is still one thing that God cannot do, and that is to turn things that have happened into things that never happened; he cannot make it so that the virgin never fell or Rome was never founded ([16], p. 406 = col. 601C). Conceding that an event that has happened cannot have happened, Peter categorically refused to regard this impossibility about the past as implying a form of impotence for God, and this for two main reasons. First, the distinction between past, present and future does not exist for God, who observes all successive events in a simultaneous present. Being outside time, he is not bound by the past any more than by the present or future, but from the height of his panoramic eternity, watches together all times and events ([16], pp. 418–432 = col. 604C-608A). In addition, everything that happens, and thus comes into being, takes its being from God—with the exception of evil, which is not-being. So to say that what comes to be, once it has emerged from nothing, cannot but have been, far from being a limit to the power of God, is on the contrary praise for it. What would divine power mean if something he brings into being could suddenly cease to be to the point of never having been at all? The impossibility for something that has happened to have not happened thus confirms divine omnipotence rather than limiting it ([16], pp. 432–442 = col. 608A-610C).

Although Peter addressed his letter to another monk, Desiderius, Abbot of Montecassino, with whom he had discussed divine omnipotence in the court of Rome, he repeatedly lashes out at some "dialecticians", challenging their claim to stick inappropriate syllogisms onto Christian faith ([16], p. 414, 444, 446 = col. 603C, 610D, 611B).[3] His critique takes many forms. He starts by criticising them for being bad dialecticians, who were "still unaware of what children discuss in the schools", and he takes a wicked pleasure in demonstrating the foolishness of their arguments by taking them to their absurd extremes ([16], p. 414 = col. 603BC). He also accuses the dialecticians of being "frivolous" in focusing on words, rather than on the realities in question ([16], p. 416 = col. 603D, cf. p. 412 = 602D, p. 444 = 611A-

[2] "Audenter loquor: cum omnia Deus possit, suscitare virginem non potest post ruinam" [15] p. 150, lin. 4-5 = PL 22, col. 397. PL = *Patrologia Latina.*

[3] The *dialectica* is also named p. 416 = col. 604B.

B). After this he accuses them of overconfidence, since they have taken up a question that has already been widely discussed by both pagan and Christian thinkers, none of whom was foolish enough to arrive at the incongruous conclusions deduced by the dialecticians ([16], p. 416 = 604AB). Lastly, without denying that logic can be applied to the Christian faith, Peter asserts that it is instrumental—ancillary is his word—not (as most often said) to a theological discipline that does not yet exist,[4] but to the "sacred words", in other words the Bible and its contents.[5]

7.2.3 Otloh of Sankt Emmeram, c. 1075

The third dispute is not between two individuals or groups; instead, it sets one man against himself. Gustavo Vinay has diagnosed this as a case of "neurosis" and Giulio D'Onofrio as "psychological splitting", almost schizophrenia [20, 21]. Having started out as a secular savant before becoming a monk at Sankt Emmeram in Bavaria, Otloh was a man torn between his attraction to knowledge, both sacred and profane, and his fear of it.[6] In his *Liber de tentationibus suis* he relates that, when he became a monk, study of the Holy Scriptures brought him diabolical illusions so tenacious that he began to doubt Scripture and the very existence of God [24]. In his *Liber visionum* he describes how reading the poet Lucan gave him appalling nightmares in which a merciless torturer beat him all night long to punish him for his sins [25].

Otloh was obsessed by the question of evil. In his *Dialogus de tribus quaestionibus* he asks where evil comes from, why it has passed from Adam to all men, and how it can still be possible to turn back towards good [26]. He also considers questions of method. In his introduction, Otloh worries that the book will be denigrated by strict dialecticians, because he uses certain technical terms such as "person" in a way not acceptable to the Boethian tradition ([26] col. 59A-62C). Otloh was familiar with dialectic and so his relativisation of it is deliberate, in imitation of the Bible, whose texts do not follow the rules of Boethian logic. Therefore he solves his three questions by means of a theological method that is not strictly logical, using "similitudes", that is analogies, rather than syllogistic argument; for example, he explains the transmission of original sin to all men by comparing it to single combat between two champions, whose fate extends by convention to their respective camps ([26] col. 96D). He also uses contrasts. Good, he says, is easier to understand by contrast to evil and the justice of God's strict right to punish sinners glorifies the pardon he

[4] On the birth of a distinct theological discipline in the twelfth century, see my article: [17] = [18] pp. 435–473. See also the conference: [19] (forthcoming).

[5] [16] pp. 414–416 = 603D: "Quae tamen artis humanae peritia, si quando tractandis sacris eloquiis adhibetur, non debet ius magisterii sibimet arroganter arripere, sed velut ancilla dominae quodam famulatus obsequio subservire, ne, si praecedit, oberret, et dum exteriorum verborum sequitur consequentias, intimae virtutis lumen et rectum veritatis tramitem perdat".

[6] On Otloh's life, see [22, 23].

grants to some through grace [26] col. 71BC). Otloh is therefore not opposed to dialectics and dialecticians, but he tests alternative ways of solving theological problems.

7.2.4 Manegold of Lautenbach/Wolfhelm of Cologne, c. 1085

While Lanfranc, Peter and Otloh were all born some ten years after the year 1000, Manegold of Lautenbach belonged to the next generation.[7] Unlike the first three, who were Benedictine monks, Manegold started out as an itinerant master and may even have been a husband and father, before becoming a canon regular of St Augustine. At this time the investiture controversy between Pope Gregory VII and Emperor Henry IV was at its height [64].[8] Around 1085 Manegold, who was a supporter of Gregory, wrote his *Contra Wolfelmum* addressed to Henry's supporter Wolfhelm of Cologne [33, 34]. In this text, apart from the investiture controversy, Manegold discusses the question of the relationship between the ancient philosophers, particularly Macrobius, and Christian faith. Where Wolfhelm declares the divergences between Platonic philosophy and Christian faith to be insignificant, Manegold draws up a list of them and asserts the need for critical examination. He does not believe that all the philosophical theories of the Ancients must be rejected. They include, he says, some that are so subtle that it is not easy to understand them, while others have been ratified by the "saints"—in other words the Church Fathers ([33] I, p. 44). However, alongside useful discoveries, in his view, the writings of the philosophers contain some unacceptable teachings.

For example, the Platonic doctrine of the body as a prison of the soul and the philosophers' countless definitions of the soul are incompatible with Christian belief in the resurrection of the body ([33] III-IV, pp. 49–52); Macrobius's theory that humanity is divided between four earthly zones that are sealed off from each other contradicts belief in a Church that is one and universal ([33] V, pp. 52–54); the neoplatonic theory of the three hypostases, God, intellect and the world soul, and the theory of the three principles of the world, artisan, form and matter, conflict with Christian faith in the Trinity and in creation *ex nihilo*, respectively ([33] VI, pp. 54–57), and so on to Christ's conception by a virgin, which contradicts the axiom recorded by Cicero: "If she has given birth, she has slept with a man" ([33] XIV, pp. 74–77), or his resurrection of the dead, which contradicts the ancient definition of man as a "rational, mortal animal" ([33] XXII, pp. 93–98).

In historiography, this list of divergences has often been interpreted as an indictment of philosophy, and thus as being against reason. It has also been suggested that the Manegold of *Contra Wolfelmum* cannot be the same as the Manegold who was so learned in the liberal arts that his contemporaries called him the "master of the

[7] On Manegold of Lautenbach, see [27, 28].

[8] On this controversy, see [21, 29–32].

modern masters" [34–37]. In practice, there is no reason why the two should not be the same man, since it is not philosophy itself that Manegold attacks, but a lazy syncretism which wrongly postulates that, despite disagreements more apparent than real, the ancient philosophers prefigured and corroborate Christian faith.[9] This a priori assumption of general agreement had to be revoked to enable the rigorous and autonomous development of both a philosophical work founded on the study of the Ancients and a theological work based on study of the Bible. This is what happened in the following century, for example, with the school of Abelard on the one hand and that of St Victor on the other.[10] It was surely no coincidence that Abelard's master and founder of the school of St Victor William of Champeaux was a disciple of Manegold.[11] Far from being a vestige of archaic obscurantism, the inventory of contradictions set out in *Contra Wolfelmus* marks a new, fertile and liberating awareness of doctrinal differences.

7.3 A Homogenous Group?

Can Lanfranc of Pavia, Peter Damian, Otloh of Sankt Emmeram and Manegold of Lautenbach be said to form a homogenous group, united in their rejection of dialectic and their use of an alternative method? Now it seems not. True, all four authors were from the same social milieu, being religious—primarily Benedictines—and active supporters of Gregorian Reform. The first three in particular were combating a degree of logicization of what will be called later theology—they rejected the idea that distinguishing truth and falsehood in relation to the Christian faith could be reduced to the technical work of logically formulating utterances and arguments. For them, the development of the Christian faith must primarily be grounded in patient, faith-based reading of the Christian Scriptures—the Bible first of all, and then the Church Fathers. But in this regard, they hardly form a new category of thinker, for the same could be said of almost all Christian writers, from the earliest times to the present day.

On dialectical method, the points of disagreement between our four authors are in fact far more varied than it may seem at first sight. Berengar and Lanfranc are

[9] See [20] p. 460: "L'invito a lasciarsi avvolgere dalla semplice sapienza della fide in Cristo non vuole dunque esse un'ottusa e 'anti-dialettica' negazione della filosofia, ma il cosciente riproporsi dell'autentico messagio di tanti scrittori ecclesiastici dei secoli passati: la verità dell'Incarnazione, della nascita virginale, della resurrezione avvenuta in Cristo e futura in tutti gli uomini, non sono e non potranno mai esse oggeto di indagine scientifico. […] Così, in attesa che i nuovi strumenti epistemologici provenienti dall'antichità attraverso la mediazione islamica consentano una compiuta messa a punto delle capacità scientifiche dell'intelligenza umana, l'energica riduzione delle illusioni passate compiuta dagli uomini di questa età di passagio avrà se non altro il merito di prevenire ogni ingiustificata mescolanza di religione et di conoscenza razionale".

[10] On the difference between Peter Abelard and Hugh of St Victor, their lives and thoughts, see our paper [38].

[11] On William of Champeaux, see [39].

opposed on the best suitability in theology of arguments from authority or "dialectical" arguments—in other words arguments from reason. While they agree in accepting the validity of both, they diverge in their preference for one or the other. But we have seen that both were willing to move onto their opponent's terrain for tactical reasons.

Peter meanwhile was certainly no upholder of the argument from authority over reasoning. He spends indeed his entire treatise criticising something said by St Jerome, a Church Father and major authority on Christian faith with whom he disagrees, primarily by means of reasoned argument. When he happens to attack the dialecticians, it is not to reject their discipline, or even its application to Christian faith, but to denounce the ignorant and cocksure manner in which they use it. In focusing on the form of their arguments, they lose sight of the matter to which those arguments apply, and this myopic commitment to form leads them to the wrong conclusions ([16] p. 414, 444, 446 = col. 603C, 610D, 611B).

When it comes to dialectic Otloh of Sankt Emmeram adopts an approach more defensive than offensive. The former master visibly fears that his former colleagues will criticise the liberties he takes with their art now that he is a monk and contents himself with claiming the right to use rustic language in imitation of the Scriptures. He reminds the dialecticians that their knowledge is a weapon that they must not abuse by turning it against the faithful and simple, but must use only against enemies of the faith, as the Church Fathers did.[12]

Manegold de Lautenbach has little to say about dialectic or logic, both words being absent from his treatise. When he has been placed among the anti-dialecticians it is because he seems to attack philosophy, and thus the method of rational argument on which it is based. But this is not true: it is not philosophy that Manegold criticises, but the ancient philosophers, and not as philosophers, since he acknowledges their many useful discoveries, but as pagans, in other words because, from the point of view of Christian faith, they were wrong.[13]

So we can see that the category of anti-dialecticians is something of an amalgam. From a distance, it looks like a single multi-headed chimera or hydra. But a closer look reveals quite different authors, each with their own coherence. If we postulate that the group forms a coherent front and take from each author those traits by which they attack the modern conception of philosophical work, we obtain an identikit image of the perfect obscurantist who (1) prefers arguments from authority to

[12] [40] XII = PL 146, col. 181A: "Et si in vobis sit aliquis in dialectica peritus, utatur ea sicut milites boni gladiis solent uti. Quamvis enim secum iugiter portent gladium, norunt tamen eum non nisi contra hostes extendendum. Sic et dialectici in subtili et argumentosa ratione facere debent nullum domesticum, id est fidelem et simplicem, sed sacrae fidei hostes, hoc est, haereticos solummodo gladiis verborum subtilium petentes, sicut et sancti Patres fecisse leguntur".

[13] [33] I, p. 44: "Primum discretionem legentium volumus esse premonitam nos id nequaquam de philosophis suscepisse, ut omnes eorum sententias dampnabiles senciamus, quarum quasdam pre sua subtilitate vix penetrare sufficimus, quasdam vero a sanctis viris susceptas non ignoramus, verum temeritatem tuam velle compescere, qui sic eorum subtilitates commendas, ut multifarios errores figmentis illis implicitos non attendas".

those of reason; (2) criticises the dialecticians for being wrong; (3) prefers analogies to syllogisms and (4) rejects the philosophy of the Ancients.

However, if we examine each text as a whole, we gain a completely different impression. Far from rejecting dialectic, either in itself or in its application to Christian faith, our supposed anti-dialecticians show excellent theoretical and practical knowledge of the logic of the schools, sometimes better than that of their adversaries, at least in the case of Lanfranc and Peter Damian. Above all, they seem more keenly aware of the epistemological difficulties inherent in the application of ancient logic to the data of Biblical revelation. Far from seeking to banish reasoned argument from studies in general, or from the science of the divine in particular, they seem rather to resist the logicians' naive confidence in their art and their immoderate ambition to replace scriptural experience with dialectical expertise in thinking about the Christian faith.

As for our authors using an alternative form of reason, it seems to me that the "musical reason" that Lesieur sees in the writings of Lanfranc, Peter Damian and above all Otloh is in fact a form of exegetic rationality that can be seen in the Scriptures themselves, notably the Epistles of St Paul, and which was subsequently developed by the Church Fathers and the authors of the early Middle Ages (see [10], pp. 255–350). The spiritual interpretation of the Bible involves comparing different episodes to see them as similar (Abel and Job as figures of Christ) or, more rarely, contrary (Eve and Adam as antitypes of Mary and Christ). From the patristic period to the modern era, most of the great Christian thinkers (such as Augustine, Bonaventure or Pascal) practised both this allegorical exegesis of the Scriptures and a dialectical approach to doctrinal questions. Doesn't everyone use different forms of reason—deductive, analogical, erudite, poetic and whatever else—as circumstances require? The surprising thing is thus not that they coexist in one man or one milieu, but that, in some situations, they tend to become specialised, and even to conflict, which is what happened in our authors. This is what I should like to show in the final part, relocating our authors within a longer perspective.

7.4 The "Anti-dialecticians" in History

Let us start with historiography. There is no doubt that the political seedbed that produced or welcomed the category of anti-dialecticians—the Kulturkampf in Germany, anticlericalism in France—also led to an over-systematised opposition between the dialecticians—heroes of the Enlightenment and free thought—and the anti-dialecticians, viewed as accomplices of the clerical and mystical reaction.[14] We must be aware of this, so as not to force the line by exaggeratedly opposing two

[14] "Lorsqu'on arrive au XIe siècle, le siècle de saint Anselme, on distingue et oppose, dans la plupart des histoires de la philosophie médiévale, dialecticiens et antidialecticiens, ou dialecticiens et mystiques". ([41], p. 423).

camps, that of the dialecticians against that of the anti-dialecticians, that of the rationalists against that of the fideists, or even irrationalists.

Even without giving way to such caricatures, even today there is still a temptation to interpret the series of disputes in terms of intellectual progress and conservatism. Yet a historical perspective invites us to read it instead as a case of intellectual scissiparity, i.e. the birth of a new living being by division, envenomed by twin growth spurts. Before the mid-eleventh century, the most important masters, such as Gerbert of Aurillac († 1003), Abbo of Fleury († 1004) and Fulbert of Chartres († 1028), whether they were monks, laymen or successively both, taught a common culture in which profane and sacred knowledge coexisted in peace and harmony [63].[15] What was new, around 1050, was the breakdown of this equilibrium and a concomitant increase in tension between regulars and laymen and between monastic and pre-scholastic culture [47].

This breakdown had twin causes. On the one side, there were new religious aspirations; on the other there was a new drive for intellectual rigour. On the one hand, in reaction against feudalism's grip on the Church, there was a growing desire to moralise the monks and clerics, to free them from the secular powers and to return to the fundamentals of the Gospel—in other words what is known as Gregorian Reform.[16] On the other, in response to a new necessity, perhaps fostered by the advances of Islam, there was a desire to stop basing Christian faith solely on the authority of the Scriptures and Fathers, to give it a grounding in reason and to express it in universal and necessary terms—in other words a kind of logical turn, which was marked by a return to Boethius, Porphyry and Aristotle [50–52].

These two contemporary movements, Gregorian Reform and the renaissance of logic, were in fact the two facets of the same existential and intellectual concern, the same need for religious and doctrinal solidity, which some were driven to seek in solitude and austerity, the others in certainty and necessity. Hence an initial degree of porosity between the two attitudes. We see more than one savant move from school to cloister, and more than one monk respond to the thirst for logic among his fellows.[17] However, over time, these two facets of the same impulse began first to diverge, and then to clash.

In a way, opposition entrenched each side in their difference. Intoxicated by the power granted them by their mastery of reason and words, the dialecticians risked forgetting that the Christian faith that had been constructed over centuries was a fragile balance, like a Calder mobile, between contrasting truths that need to be reconciled. They risked underestimating the hermeneutic and existential element of Christian doctrine and reducing theological activity to technical work on statements [53–55, 62]. Conversely, through their antagonism to logicians, monks seemed relegated to the less deductive and systematic, more emotional and exegetic aspect of

[15] On Gerbert of Aurillac, Abbo of Fleury and Fulbert of Chartres, see [38, 42–46].

[16] On Gregorian Reform, see [48, 49].

[17] To take only the best-known examples, Anselm of Cantorbery and Peter Abelard both undertook to demonstrate the affirmations of the Christian faith without the help of the Scriptures at the request of their students, and both went from the status of *scholaris* to that of *monachus*.

what had once been a culture shared by monks and laymen alike, that of Gerbert, Abbo and Fulbert. In monastic circles this fostered the rise of a specialised literature of commentaries and sermons on the Bible, spiritual visions and revelations, meditative images and parables. In short, as the monks gradually moved away from logic, their writings became more and more "mystical".[18] In this way what had been a single culture for preceding generations became split.

Demographic growth did the rest. Throughout the eleventh century the social groups of monks and masters grew in number and strength and became rivals in the exercise of doctrinal magisterium. Whose role was it to decide a question of Christian faith? In principle it fell to the bishops, as successors to the apostles; but in practice the bishops were often too busy with political and pastoral matters to become embroiled in increasingly specialised disputes, which required increasingly specialist training [57]. So there was a vacuum to be filled and power to be won. Who would seize it? Would it be the monks, whose lives were devoted to religious matters? Or would it be the masters, whose knowledge equipped them to manipulate statements? In the mid-eleventh century everything was open, and this no doubt rendered the disputes more bitter.

In this regard the lay master Berengar, who provoked the monastic master Lanfranc to a duel of words on the Eucharist, seems to exemplify the rise of the secular schools, which sought to gain the ascendant over the rising power of the monasteries. Conversely, the monk Peter Damian, who asserted the ancillary nature of dialectic in relation to monastic *lectio divina*, above and beyond far older discussions of whether logic was by nature instrumental or not, clearly expresses the refusal of one social group to allow itself to be supplanted by another.

Between the monks and masters the duel remained a dialogue of the deaf, since each remained strictly faithful to their own training. There could be no way out of the dispute until one of the two sides, or better still both, stepped over the barrier between them and trained in both dialectical and monastic knowledge. As we have seen, the process began with Lanfranc and Berengar, who in a sense reversed their roles; it continued with Peter, who proved a better logician than his opponents; but it was completed in the late eleventh century in the works of Anselm of Canterbury. At once monk and logician, St Anselm managed to reconcile both requirements, with the greatest respect for both dialectical rigour and divine transcendence [60, 61]. The words of his *Proslogion*, "a being than which no greater can be conceived", were not only the starting point for a famous proof of the existence of God, but also a brilliant synthesis of the two traditions, since at the same time they satisfied the most demanding logician with a designation of God that was perfectly manipulable by syllogism, and reassured the most demanding monk through its entirely negative formulation: "a being than which no greater can be conceived".[19]

[18] We deliberately take this word in a modern and vague sense, without prejudging its value as a relevant category for analyzing medieval texts and thought, see [56].

[19] "id quo maius cogitari nequit", ch. 2, 3, 15, etc.; [58], p. 101, 102, 112, etc.

With St Anselm the first series of doctrinal disputes were closed, the dialogue of the deaf became an exchange and the cultural split between monks and masters temporarily healed over. It reopened during the twelfth century, first pitting St Bernard and William of St Thierry against Peter Abelard and Gilbert of Poitiers, then Joachim of Fiore against Peter Lombard, before resorbing in the thirteenth century in the ideal of the life of mendicant friars such as Bonaventure and Thomas Aquinas, who were both mendicants and university scholars.[20]

7.5 Conclusion

The series of disputes that we have studied was thus merely a phase in the history of medieval logic; it has meaning only when interpreted in the light of what came before and after it. Perhaps its main lesson for us is that the history of logic is not always linear and that different logics, both strict and vague, canonical and alternative, academic and spontaneous, can coexist in a single period, sometimes in a single individual, diverging and converging as circumstances dictate. In this light, my logic is defined not just by what it does, its own manner of proceeding, but also by what it excludes and represses, and which goes on existing in others, in negative form, manifested in controversy, competition and sometimes in a dialogue of the deaf. In this sense, the so-called anti-dialecticians teach us about the split between two logics, rather than a simple rejection of logic.

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Chapter 8
Illogical Thinking: Problems Concerning Medieval Notions of "Idiocy" and "Rationality"

Irina Metzler

Abstract This essay looks at the notion of the non-speaking and therefore the presumed non-rational person, whose fully human status was debatable and debated during the Middle Ages, following a development that especially arose from the new intellectual culture of the universities and the impact of Aristotelianism in the thirteenth century. Persons who were congenitally intellectually disabled, as the modern definition has it, could in medieval thinking sometimes reside at the interstices of human, and therefore supposedly fully rational, and non-human (animal) being, an in-between, liminal position often defined according to the individual's capacity for language and speech, hence the importance of the notion of being both deprived of language and rationality. Children, animals, intellectually disabled but also congenitally deaf people could all be considered irrational due to their lack of speech. These disparate categories, according to modern classifications, demonstrate that medieval systems of knowledge used schema to make sense of the world that differed significantly from modern medico-scientific concepts. Specifically, the essay tries to examine possible reasons for why, on the one hand, humans deemed irrational, illogical ("idiots") are *not* put on trial, yet, on the other hand, animals deemed illogical sometimes are prosecuted.

Keywords Intellectual disability · Rationality · Language · Children · Animals · Legal history

Mathematics Subject Classification Primary 00A– Secondary 03-03 - 03A – 03B

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8.1 Introduction

In most societies, non-human animals shared with intellectually disabled persons and with the insane a theoretical exclusion from culpability for felonies. Animals by definition are not logical, so in theory they too, like human "idiots", should be exempt from judicial proceedings on the grounds of being irrational. But animals (mainly pigs and other large domestic animals which had caused injury to people) were put on trial throughout the medieval period—in fact, if one believes the examples amassed by E. P. Evans, all the way up to the end of the nineteenth century. The law struggled with determining responsibility in cases of criminal actions by mentally incapable humans (commonly defined as children and the insane, as well as the intellectually disabled) and by animals. Jurists through the ages have grappled with attempts at defining mental competency or degrees of personal responsibility. Such legal musings were not just about the extremes, that is, it was "not a question of raving madness or of drivelling idiocy, perceptible to the coarsest understanding and the crassest ignorance; but the slightest morbid disturbance, impairing the full and healthy exercise of the mental faculties, must be examined and estimated" ([1], p. 201). Medieval (secular and canon) law considered children inculpable, furthermore considered mentally incompetent persons as children in the eye of the law, hence also inculpable, and, at least theoretically, noted that animals also lack moral and legal agency. All three categories of beings—children, the intellectually disabled as well as the insane and animals—were believed to lack logical reasoning, abstraction and (fully-formed) speech. The topic of natural logic is addressed by Julie Brumberg-Chaumont in her work dedicated to the social history of logic during the thirteenth century [2] and in her paper in the present volume. Because they were believed to lack rationality, animals and disabled humans could not be held responsible for their acts, amongst other reasons because they were believed to retain no memory of such acts. Therefore, according to a late thirteenth-century Anglo-Norman legal textbook, for instance, pardons could be given for "natural fools [*fous*] and children within the age of seven years; for there can be no crime or sin without a corrupt will, and there can be no corruption of will where there is no discretion [*discrecion*] and an innocent conscience" ([3], pp. 138–139).

Nevertheless, as the famous study by Evans had shown, there were numerous cases repeatedly over the entire course of the Middle Ages where animals were put on trial and prosecuted according to the same legal processes as conventionally used for rational humans. Arguably the first criminal proceedings against animals in Western culture stem from Exodus 21: 28–30 with the injunction that if an ox had killed a man or a woman that ox was to be stoned to death and its meat was not permitted to be eaten. Animal trials did not die out with the end of the Middle Ages, as the handy "Chronological List of Excommunications and Prosecutions of Animals from the Ninth to the Nineteenth Century" shows ([1], Appendix F, pp. 313–334). At the time of printing Evans's book the very last case in this list, from 1906, concerned a dog which was prosecuted together with its two owners for the robbery and killing of a man in Switzerland; the dog demonstrating "fierce and

effective cooperation" so that while the two men were "sentenced to lifelong imprisonment, but the dog, as the chief culprit, without whose complicity the crime could not have been committed, was condemned to death" ([1], p. 334).

The problem of pre-modern animal trials has been extensively studied since the days of Evans a century ago. An early follow-up to Evans, so to speak, was an article by W. W. Hyde on "The Prosecution and Punishment of Animals and Lifeless Things in the Middle Ages and Modern Times" [4] who, in the best positivist tradition, emphasised the primitive and irrational attitudes of pre-modern legal systems, a stance, interestingly, still held by Georg Oesterdiekhoff who considered developmental theory of mind and rationality [5]. Academic interest in the topic then waned, until the re-printing of Evans's classic with a foreword by neuropsychologist Nicholas Humphrey in 1987 aroused renewed scholarly attention [6]. A number of brief reviews in academic journals of Evans's reprinted volume commenced the trend, such as Paul Robertshaw in 1988 [7], or Donna Mehos in 1990 [8]. Longer studies of Evans's work and animal trials as a whole followed. Esther Cohen [9] tried to present a more nuanced, culturally specific interpretation, as did Piers Beirnes [10], Paul Berman [11] and Peter Dinzelbacher [12], whose article was expanded into a monograph [13] and appears to echo the approach taken by Darren Oldridge [14]; finally, Jen Girgen [15]. The latest perspective is a Foucauldian analysis by Emre Koyuncu [16]. The veracity of the historical record concerning animal trials has been challenged by Eva Schumann [17] who has argued that not a single medieval German primary source for the judicial punishment and execution of animals exist, and that the majority of attested cases stem only from France. An overview of animal trials in general is given in the recent collection of essays by Andreas Deutsch and Peter König [18].

Legal historians have tended to look at *either* the "insanity defense" for human culprits, *or* at animals in law, but not considered the inculpability of both animal and mentally incompetent human together, nor have legal historians engaged much with the wider ramifications of the concepts of rationality according to medieval philosophy, theology and natural history. This essay will explore some of these scenarios, and will attempt an interpretation and explanation of the apparent paradox between irrational animals and criminal prosecution based on rationality.

8.2 Children, Children-Like Beings and the Problem of the "Alogon" in Antiquity

Let us commence with infancy, the beginning of life for sentient beings. One theme of the colloquium which invited this volume was "the infancy of logic", which makes for some interesting thoughts vis-à-vis the topic of medieval notions of logic [19]. Briefly put, according to medieval philosophy, the "infancy of logic" would be an oxymoron, since by definition infants possess no logic, therefore there can be no infancy of something that does not exist. The infancy of logic according to a

medieval Aristotelian would be no logic whatsoever, the illogical thing, hence a contradiction in terms. With regard to legal culpability, the absence of logic and of speech in the infant brings with it the problem of reliability. This is a problem explored by historians of madness intersecting with jurisprudence, and worth citing at length:

> Etymologically, the infant is an animal without language: *infans*, it does not speak. Or, if it speaks, it babbles, making up stories, speaking illogically and irrationally. How then could a child be taken as a qualified witness? How could we believe, for example, if he told us he had witnessed a crime or had been molested? But, on the other hand, how can we prove that he is not telling the truth? Old debate, quite insoluble. The child, like the feeble-minded or the hypnotized person, is the unreliable witness *par excellence*; not because he always lies (if only!), but because, without external corroboration, it is as impossible to prove he is telling the truth as it is to prove the contrary. And yet, as soon as he speaks, his speech must be judged. True or false? Since there is no real basis for a decision, the decision is bound to be a matter of belief and interpretation, and, as such, perfectly arbitrary and unjustifiable. How many juries have thus been accused of letting criminals of the hook or, on the contrary, of condemning innocents? ([20], p. 37)

Having touched on the theme of lack of speech, or defective speech in infancy, it is worth taking a closer look at the connection between children and the intellectually disabled, starting with antiquity. According to ideas developed first by the Presocratic philosophers, followed by Plato and Aristotle, properly controlled emotions are rational judgements which can in turn control the irrational forces, and the emotions are themselves a cognitive process, a concept taken up and further developed by the Stoics, Neoplatonists and Christian philosophers ([21], pp. 17, 19–28). Emotions allow for value judgements, permitting the distinction between good and bad ([21], pp. 29–33). The problem is that animals never develop beyond such "basic instincts", while in the normal course of individual human development from infant to adult the instinctive reactions are gradually added to and augmented by higher cognitive functions. Thus, by the age of 14, according to the Stoic philosopher Posidonius (c.135-51 BC), the rational side of cognitive processes should be developed enough to take control of the emotions and of physical movements:

> This [rational element] is small at first and weak, but finishes up large and strong around the fourteenth year, by when it is right for it, like a charioteer, to take control (*kratein*) and rule (*arkhein*) over the pair of horses naturally conjoined with it, appetite (*epithumia*) and anger (*thumos*) ([22], p. 324, cited in ([21], p. 96)

The metaphor of the charioteer stems from Plato, *Phaedrus* 246 A-257 B; this psychodynamic tug between reason and two irrational forces had even influenced Sigmund Freud on "The Ego and the Id" [23]. The education of children is hence an important aspect of gaining understanding of the nature of things that allows a person to develop rational thought. Posidonius, as related by Galen, allowed for the existence of emotions without judgement in animals and children, "especially appetite for pleasure (*epithumia*) and anger (*thumos*)" ([21], p. 125).

Human infants are referred to literally as "non-speakers" in the famous term *alogon*. Animals may vocalise, but because they do not speak in the human sense they were termed *aphônon*, without voice, according to ancient Greek laws ([1],

p. 173). Galen provided some interesting thoughts on animals: "whether the so-called unreasonable animals are not at all partaking in reason/language (*logos*) remains obscure. Although they have no expression through voice, which one can define as communication, perhaps they all have a reasonable soul which we define as innate (*endiathetos*, literally deep-seated), some more, some less … But only man can acquire knowledge at will" ([24], p. 140; citing Galen in condensed form via [25], vol. 1, pp. 1–2). The Greek words are difficult to translate, since voice, speech, reason and intellect were expressed by the same word *logos*.

Let us have a closer look at language, *logos* and reason. With regard to language, one late antique philosopher, Porphyry (born Malkos of Tyre around 233, teaching philosophy at Rome from the 240s until 268), argued for the possibility that non-vocal, non-oral forms of expression, such as that made by animals, can be true language, and thus human speech alone is not the defining characteristic of *logos*. In his treatise *On abstinence from killing animals* [26], Porphyry presented the novel notion that animals as well as humans possess language and therefore also *logos*, that is the capacity for rational thought.

> Now since that which is voiced by the tongue is *logos* [discourse] however it is voiced, whether in barbarian or Greek, dog or cattle fashion, animals which have a voice share in *logos*, humans speaking in accordance with human customs and animals according to the customs each has acquired from the gods and nature. … For we are aware only of noise and sound, because we do not understand (say) Scythian speech, and they seem to us to be making noises and articulating nothing: they just make a sound which sometimes lasts a longer time and sometimes a shorter time, but the modification to convey meaning does not strike us at all. Yet to them their speech is easy to understand and very distinct, just as our accustomed speech is to us; and similarly in the case of animals, understanding comes to them in a way which is peculiar to each species, but we can hear only noise deficient in meaning, because no one who had learned our language has taught us to translate into it what is said by animals (*On abstinence* 3.3.3-5, translation given in [27], pp. 119–120)

This is essentially a relativistic argument, whereby all utterances are accorded the status of *logos*, and difficulty in understanding resides in the ignorance of the listener, not in the lack of *logos* in the speaker. But Porphyry goes still further than this, and even presents an argument that *logos* need not be voiced:

> How can it not be ignorant to call only human speech *logos*, because we understand it, and dismiss the speech of other animals? It is as if ravens claimed that theirs was the only language, and we lack *logos*, because we say things which are not meaningful to them. … But surely it is absurd to judge rationality or irrationality by whether speech is or is not easy to understand, or by silence or voice (*On abstinence* 3.5.2-3, translation given in [27], p. 120 ff.)

By extrapolation, what Porphyry stated about animals and "barbarian" non-Greeks, must also hold for speech-impaired humans, and ultimately for people with such intellectual disabilities whose language ability is reduced.

By the early Christian era, Augustine followed the distinction between humans and animals, creatures with reason and those without, what in Greek philosophy had been termed *aloga zôa* "living beings without language". Some of Augustine's philosophical thoughts on animals and un/reason may be found in his tract "83 Questions on Various Topics" ([28]; see also [29]). Augustine had already emphasised the

differences between irrational and rational elements within the make-up of the human soul. When God created human beings certain faculties were given to the soul: "To the irrational soul also He gave memory, sense, appetite, to the rational he gave in addition intellect, intelligence and will" (*The City of God*, 5.11, cited in [21], p. 335).

If will is a characteristic of the rational soul, and if children, animals and by implication the intellectually disabled do not have a fully developed rational soul, then it follows that none of these three beings possess will either. This troubled Cassiodorus as much as it had Augustine.

> If God creates perfect and rational souls, why are infants not thus and children too? Can their limited capacity for knowing be explained by their comparative bodily weakness? Is this something like what happens when a fire is confined in a narrow vessel and cannot burn freely? (*Si divinitas perfectas et rationabilies animas cret, cur aut posito sensu vivunt infantes aut iuvenes inveniuntur excordes? Se quis non intendat animas parvulorum imbecillitate corporis nec officia sensuum nec ministeria posse explicare membrorum? Ut si ignem anbusto vase concludas*) (*De anima*, VII.549 [30])

8.3 Medieval Period

It has been posited that one way for the medieval philosopher to look at this problem is to surmise that faculties will reach as far as they can if nothing impedes them. In his tractate on the soul, Nemesius asserted that God "linked articulate speech to thought and reasoning, making it a messenger of the movements of the intellect" (Section 1 [4.20], [31], p. 40). *De Natura hominis* was among the earliest tracts translated in Latin during the twelfth century, and had even enjoyed two early translations. Isidore in the *Etymologies* defined the infant as the non-speaker:

> A human being of the first age is called an infant (*infans*); it is called an infant, because it does not yet know how to speak (*in-*, 'not'; *fari*, present participle *fans*, 'speaking'), that is, it cannot talk (*Infans dicitur homo primae aetatis; dictus autem infans quia adhuc fari nescit, id est loqui non potest*), Book XI.ii.11 ([32], p. 241; Latin at [33]).

The position of animals with their defective souls as reminders to humans of the beastly physical materiality is discussed by Patricia Cox Miller [34].

By the high Middle Ages, Albertus Magnus was interested in the nature of human language and its imitation in other animals. He discerned between *vox* (sounds signifying to one another some interior state) and *sermo* (the expression of concepts through articulate speech) to refine his notions of reason, language, and the relationship between the two [35, 36]. Thus a human infant, like an animal, could utter sounds quite readily that showed basic sensory perception and emotional reactions connected therewith (feeling hot, cold, wet, hungry, hurt, and so on), but not more. In *Liber de Animalibus* Albertus Magnus treated pygmies as below human but above monkeys in the chain of being, due to their lack of abstraction, for although pygmies can speak,

> they do not argue or speak about the universals of things … Reason has two principles. One comes from sense and memory, where the perception of experience lies; the other is that which it possesses when elevated to a unitary intellect, i.e. that which is capable of eliciting universals … The pygmy, however, has only the first of these (*Liber de Animalibus*, 21.1.1 [37]; [38], p. 303)

But there are also humans who cannot abstract, whom Albertus calls *moriones*, following Augustine. They are fully human but are

> Foolish [*stulti*] by nature because they are incapable of apprehending reason, and their speech utterances resemble the pygmy's. But the pygmy lacks reason by nature, whereas *moriones* do not lack possession of reason but rather the use of it, as a result of melancholy or some other accident ([37], cited by [38], p. 303)

With regard to Albertus and his thinking on animals one may also see Guldentops [39] and Hoßfeld [40]. This is a highly interesting point, because according to Albert's classification people with intellectual disabilities never lose their status as fully human, their inherent rationality is not in doubt, only damageable by accident.

Another thirteenth-century university master, Henry of Ghent (born around 1240, became master of theology at Paris in 1275, died 1293), made a series of quodlibetal disputations on free will; the first series of disputation edited as *Quodlibet* I was held in 1276, and stated that without previous knowledge of the intellect the will cannot act:

> As a result, in insane persons whose intellects are destroyed, there is no appetite of the will, but only the sensitive appetite of an animal. For, if the intellect is taken away, the human being remains only as an animal (Quodlibet I, Question 15 [41], p. 31)

We may now turn to the subject of deprivation, destruction or loss of intellectual faculties. A person may also have been *alogon*, in the Greek extended sense of the word, due to sensory loss. This is *alogon* in a kind of non-functional way. How the loss of a sense affects a person is examined by Jean de Jandun, a French scholastic in the early fourteenth century, who in his *Questions* on the *De sensu* compared a child growing up in total isolation to a person impaired by hearing and speech loss.

> It has been said that because such a mute [*mutus*] has not heard any meaningful speech, he cannot utter any. In question is: if a boy were reared in a forest, where he had never heard any kind of language, whether he would speak any language … Some say that he would speak Hebrew, and that that language is natural; but this is not true, because then it would be adapted to all men and all would speak naturally that, which is false and evident to sense. Likewise, there is no habit of any speech unless through the social intercourse of men, and hence I say that he would not speak a language; he could well from natural appetite form sounds, but no consistent expressions unless he were later to have intercourse with others ([42], p. 7r; cited in [43], pp. 276–277)

What is not just interesting as an intellectual observation but downright revolutionary in terms of how the deaf were perceived is Jean's statement that the acquisition of verbal language is not innate but a social event.

Another philosopher of the early fourteenth century, Marsilius of Inghen, also theorised the effects of a child growing up in isolation and compared the effects on language development to that of a mute. Marsilius also rejected the notion of

Hebrew as the "natural" language as a "silly and ridiculous" idea. Furthermore, he said:

> That that boy would remain mute until he was established by other men in a definite language; but if there were two boys placed together … these could mutually set up between themselves a new language ([44], fol. 7 (8) recto; see [45]; cited in [43], p. 277)

The novel idea Marsilius therefore introduced was that the desire for communication was innate to human beings, irrespective of their faculties or circumstances. Thus, at the turn of the thirteenth to the fourteenth century it was recognised that communication relied on socialisation of the individual at an early stage in life.

Furthermore, Jean de Jandun had questioned the widely accepted ancient idea that there was a sympathetic association between the nerves of the ear and the vocal organs, so that the deaf were incurably speechless as well. Concerning why congenitally deaf people are also speech impaired, Jean said in contrast to this prevailing notion that someone who cannot learn how to form meaningful speech at will is perforce also dumb:

> This is self-evident, because knowing how to form meaningful speech at will comes about only through habit and social intercourse with people, but someone congenitally deaf cannot become accustomed to the expression of meaningful speech, because this requires that he hears speech of this kind ([42], q. 7; cited in [43], p. 284).

More importantly, ideas such as those of Jean and Marsilius removed the association between congenital deafness and intellectual impairment. The prevailing notion had been that the congenitally deaf were also incapable of speech, which in turn meant they were incapable of rational thought, according to antique and medieval theories of cognition. Aristotle, for example, had said that of all the senses sight might be superior in gathering information, but hearing served a greater role in shaping intelligence, since it made possible rational discourse; he furthermore stated that congenitally blind people were more intelligent than congenitally deaf or mute people (*De sensu*, 437a; [46], p. 24).

Such philosophical, scientific and medical concepts had judicial consequences. In the Justinian codes, some distinction was made according to types of hearing and speech impediment. A deaf person could not promise by *stipulatio*, that is an initially oral contract which only later becomes written ([47], p. 84; cf. *Institutes* 3.19.7)—although this only applied to those totally deaf and not simply to those who were hard of hearing—but many mute people could conduct all their business affairs as long as they could write ([48], pp. 71–73). The distinction made between someone congenitally mute and someone with acquired speech impairment in later life meant that those mute from birth were excluded from all personal participation in oral legal transactions, and also excluded from testation. In this sense, their legal status was similar to that of children or of mentally impaired persons, who were also deemed incapable under the law. The Justinian codes were particularly concerned about impaired people and their ability to make property transactions of various kinds (be it wills, stipulations, promises). Deaf, mute, incurably diseased, insane people and minors, however, had to have curators appointed for them ([47], p. 85; *Digest*, III, 3.43) in the same way as children required guardians. Those who became

mute in later life, if they could write their own testament, were allowed to make a valid will ([47], p. 84; *Institutes* II, 12.3). Neither mute people nor any others suffering from various impairments could be the legal guardians of minors or of other legally incapable people. But all groups—deaf, mute and blind—could inherit, however.

Infantilisation and abrogation of the legal rights normally accorded to non-impaired adults begin to emerge as the main themes of legal notions. They come to be fully, even verbosely expressed by the English jurist Bracton. Henry de Bracton was a thirteenth-century clerk and author of a volume on the common laws and customs of England, based on Roman civil law. Jumping ahead to the thirteenth century, we find here a more or less complete reception of the legal restrictions placed on intellectually disabled, and congenitally deaf and mute people that the Justinian code had contained. Bracton's passage on those who cannot stipulate is an amalgamation and reworking of several passages from the Justinian code. A speech impaired person cannot utter the necessary words, nor can a deaf mute, unless both parties agree on using "a nod or a writing". The distinction between the hard of hearing and the "stone-deaf" is made yet again ([49], Volume 2, p. 286). Interestingly, the reasons why lunatics and children cannot stipulate (they cannot understand what they are doing) are separated out from those why the deaf mute cannot do so—for once there is a clear separation between deaf/mutes on the one hand and lunatics/infants on the other. However, in a passage on excuses for not putting in a legal claim Bracton does lump "idiots and those born deaf and dumb and the like" into the same bracket, since those persons "lack reason", while allowing for this condition to change only for the madmen and children, but not for the congenitally deaf mute ([49], Volume 2, p. 356). If we take this particular passage in isolation the impression emerges that according to Bracton the mental abilities of "idiots" and deaf mutes are permanently fixed below the required level of rationality. Whether impaired or insane, people with mental aberrations in all the pre-modern legal texts—Greek, Roman and medieval—are described as perennial children because they cannot "rule themselves", as so many legal texts put it conceptually. The ancient Greek metaphor of a charioteer (reason) ruling over the team of horses (emotions or passions) which Posidonius used (see above) sets the tone for the legalistic concept of governing oneself. An example from Roman law can be found in the *Institutes* of Justinian:

> A baby and a child barely past infancy hardly differ from the insane, in that they are too young to understand anything (*nam infans et qui infanti proximus est non multum a furioso distant, quia huius aetatis pupilli nullum intellectum habent*) (*Institutiones* 3.19.10, [50], p. 108 Latin, p. 111 English)

In general, ancient Greek and Roman law had a tendency "to regard insanity as akin to infancy, a tendency still extant as late as the seventeenth century" ([51], p. 28). This therefore fits quite well with antique and medieval philosophical concepts of the deprivation of infants, "idiots" and animals from the community of the intellect, who are relegated to the realm of irrational, and therefore somewhat lesser beings:

> The very rule of law, recognized as reason's cardinal gift, is available only to and for rational beings and rational purposes. What the *infans* and the *furiosus* have in common is just this absence of rationality that would otherwise grant them legal status. Hence both have their affairs and interests placed in custody ([51], p. 31)

Interestingly, in the antique and later in the medieval period, this lack of rationality is not pathologised, it is not a malady or a recognised disease that requires medical treatment. So unlike our modern times, where the insane person who would be regarded as requiring medical treatment is distinguished from the infant, who (if otherwise "healthy") does not need medical attention, the antique and medieval systems put insane and infant together, because both are unfit for the rational activity of citizenship. "What the madman shared with the infant was not a recognized disease or malady or measured deficiency. It was, rather, the unfitness of both for citizenship, and the fact that punishment would do nothing to improve them" ([51], pp. 34–35). The free citizen had the capacity, under the discipline of law, for freedom of action. But infants and "idiots" lacked this capacity, albeit for different reasons:

> The Roman *infans* has the capacity for such nurturance but, of course, has not yet been nurtured. The profoundly retarded (*ideotus*) lacks the capacity itself ([51], p. 35)

The former can develop out of irrationality, the latter is forever stuck in the illogical.

Laws then are part of the cultural assumptions about the difference and inferiority of a person's disability that may lead to exclusion in daily life. But legal concepts are only part of wider normative forces. As an example, the notion of the innocence, therefore of the inability to be sinful, and in legal parlance the criminal inculpability of the deaf, the mute—and the mentally disabled—can be taken further into the realm of philosophy and theology.

We have seen that, legally, the intellectually disabled and the congenitally deaf were sometimes categorised with children and the insane. The notion of the innocence, therefore of the inability to be sinful, and in legal parlance the criminal inculpability of the mentally disabled, was succinctly expressed in the *Ethics (Scito teipsum)* of Peter Abelard. Writing before 1140 Abelard stated:

> Sin is said to be that contempt of God or consent to evil from which little children and the naturally foolish (*naturaliter stulti*) are immune; since they have no merits and, as it were, lack reason, nothing is imputed to them as sin ([52], p. 56 Latin and p. 57 English; see also [53])

The insane and children cannot sin, they are innocent, but that is precisely because they lack reason, which in other respects is one of the defining characteristics of a human being. While being morally protected, the overall humanity of children and the insane is arguably somewhat dubious.

By the later Middle Ages such philosophical concepts could be expanded into religious thought (and perhaps practice). On the question of whether "idiots" should receive baptism, Thomas Aquinas argued:

> Madmen and imbeciles lack the use of reason accidentally, i.e. through some impediment in a bodily organ; but not like irrational animals through want of a rational soul (*furiosi vel amentes carent usu rationis per accidens, scilicet propter aliquod impedimentum organi corporalis, non autem propter defectum animae rationalis, scicut bruta animalia*), *Summa theologiae*, Third part, Question 68, Article 12, Reply to Objection 2 ([54])

Therefore, both should be baptised. And on who can or cannot receive the Eucharist, Aquinas wrote:

> The same reason holds good of newly born children (*pueris recenter natis*) as of the insane (*amentibus*) who never have had the use of reason (*usum rationis*): consequently, the sacred mysteries are not to be given to them. … But when children once begin to have some use of reason so as to be able to conceive some devotion for the sacrament, then it can be given to them, *Summa theologiae*, Third part, Question 80, Article 9, Reply to Objection 3 ([54])

Furthermore, a late medieval notion held that animals, infidels and the irrational or unthinking cannot experience the Eucharist properly ([55], p. 67). Unlike lepers or other physically ill people, the mentally afflicted/disturbed could neither confess nor take communion; unlike the physically diseased, they were thus truly segregated from the body of the faithful ([56], pp. 54–59).

The boundaries between theology, philosophy and psychology as they are today were non-existent in the Middle Ages. Soul (*anima*) and mind (*animus*) are linked for the Christian philosopher, the human soul therefore is a thinking soul as well as being an animating force. Philosophically, and subsequently judicially, medieval intellectual disability was considered the absence of the use of reason, the irrational, which contrasted the intellectually disabled with the bowdlerised Aristotelian concept of man as the rational animal. The "rational animal" was a concept that came to be ubiquitously cited in natural philosophy and theology of the Middle Ages, although Aristotle himself did not leave such a foundational sentence on human psychology to posterity (on this point see [38], pp. 34–36).

The eleventh century saw the rise of the arrogance of the *literati*, who expressed in their writings "bottomless contempt for those who did not share their [clerkly] skills", formulated in the "hostility of the *clericus* towards the *illiteratus*, *idiota*, *rusticus*" ([57], p. 139). Coupled with this was a scholastic, academic interest in topics like the soul, intellect and rationality, which the growth of the schools and universities, and with the rediscovery of the Aristotelian corpus influenced in the themes in philosophy that were being treated in the twelfth and thirteenth centuries: this "influx of information which stimulated the intellect could not fail to stimulate the examination of the phenomenon of intellect" ([58], p. 142).

The late twelfth/early thirteenth century, with developments of scholastic philosophy on the soul, the mind, and "intellect" is the period during which a notion of what we can identify as "intelligence" (and therefore also its opposite, intellectual disability) becomes consolidated. The question though is how much of this rarified university discussion on intelligence filters down. Or conversely, do social conventions, with ideas, e.g. of peasants as "natural idiots", work their way up to the new social stratum of the clerk, the university trained intellectual? Philosophical and religious notions such as these underpinned the primacy of language and ensured the relegation of "idiots", children, the deaf and the mute to a dubious status,

ambiguously sharing qualities of both rational man and the dumb beasts. It is important to remember that the schoolmen regarded infants as incomplete human beings, not incomplete *per se*, but incomplete because they had not fulfilled their potential—they were immature. But there were social and legal consequences attached to such philosophical concepts. Immaturity is imperfection. This is the basis of the philosophical argument for the domination over animals, children, and due to the child-like state ascribed to them also over the mentally disabled, and the deaf and dumb because communication difficulties placed them in the same group as the insane.

8.4 Intellectual Practices, Legal Practice and the Culpability of Animals

As we have seen, such philosophical concepts had legal consequences for children, the insane and the intellectually disabled during the medieval period. But despite Bracton and other medieval jurists who receive and re-work Roman law, there is an alternative current in medieval legal practice, as opposed to legal theory. This is where medieval concepts of law may differ from both antiquity and modern laws, in that the notorious legal trials of animals are quite obviously applying what in modern thinking is a "rational" concept, namely law, to irrational creatures. There are numerous cases, from throughout the Middle Ages, of the extension of criminal culpability to animals, rather than using the animal example as a case in point to reduce human culpability. This means that the fully rational, as modern concepts would hold, is accorded to animals as well, at least at a populist level, in contrast to the learned theological notions. One may emphasise that whereas in medieval thinking insanity is seen as loss of rationality and loss of what defines the human, intellectual disability is in contrast not viewed in same way, despite having questionable rationality ([59], pp. 97–98). This medieval populist contradiction raises further questions: Are animals accorded some kind of rational status by this populist legal procedure? Or are animals irrational yet culpable, while in contrast, people with intellectual disabilities are still deemed rational although not culpable? Is it only people who are mad who are deemed fully irrational? Is it because people with intellectual disabilities are considered to be like children, and children are pre-rational rather than irrational (the potential intellect in Thomist philosophy), so that people with intellectual disabilities are exempted from legal culpability?

In general, modern studies of animals on trial have distinguished between prosecution and punishment. This is a legal history distinction made originally in the late nineteenth century by a German jurist, Karl von Amira [60], who differentiated between *Thierstrafen* (animal punishments: enacted by secular courts on animals accused of homicide) and *Thierprocesse* (animal trials: judicial proceedings by ecclesiastical courts against mainly vermin, through exorcism and excommunication). For the wider picture regarding animal–human interactions one may consult

the edited volume by Creager and William C. Jordan [61], with a number of essays covering the Middle Ages. The subject was then taken up and popularised in Anglophone circles by E.P. Evans, *The Criminal Prosecution and Capital Punishment of Animals*. Evans's medieval evidence came primarily from France, and there mainly from the later Middle Ages, with the sources often describing the judicial process in detail, as in the following example, a letter patent of Philip the Bold, Duke of Burgundy, which related the events that led to the killing of a small child by pigs:

> On the 5th of September, 1379, as two herds of swine … were feeding together near the town [of Saint-Marcel-le-Jeussey], three sows of the communal herd, excited and enraged by the squealing of one of the porklings, rushed upon Perrinot Muet ['muet' in French means 'mute,' 'dumb,' so perhaps the boy was speechless to the extent that he could not call for help when attacked], the son of the swinekeeper, and before his father could come to his rescue, threw him to the ground and so severely injured him that he died soon afterwards. The three sows, after due process of law, were condemned to death; and as both the herds had hastened to the scene of the murder and by their cries and aggressive actions showed that they approved of the assault … they were arrested as accomplices and sentenced by the court to suffer the same penalty ([1], p. 144; original French in Appendix K, p. 342)

A modern biologist with a special interest in the newly recognised discipline of anthropozoology has commented as follows:

> This episode illustrates the extent to which people of the era deemed the behaviour of animals humanlike not so much in their attribution of murder to the so-called perpetrators but in their presumption that the pigs had acted as a wilful mob, cognizant of their actions and responsible for goading the 'murderers' into action — something our modern understanding of animal behaviour would not countenance today ([62], pp. 169–170)

Rather than enumerate more instances of such trials, which can readily be consulted in the available literature, some theories and speculations as to *why* they occurred in the first place provide for more interesting (and challenging) discussion. Pondering why medieval judiciaries prosecuted animals, Evans cited a Swiss jurist, Eduard Osenbrüggen, who already in 1868 based his argument on the theory of the personification of animals ([63], pp. 139–149). Evans summarised this:

> As only a human being can commit crime and thus render himself liable to punishment, he concludes that it is only by an act of personification that the brute can be placed in the same category as man and become subject to the same penalties ([1], p. 10)

Evidence for this stems from the inclusion of domestic animals within the household in ancient and medieval times, whereby animals were "entitled to the same legal protection as human vassals" ([1], p. 10).

An additional theory Evans cited, and refuted, is that of French jurist Léon Ménebréa, who in 1846 had stated that "these procedures formed originally only a kind of symbol intended to revive the sentiment of justice among the masses of the people, who knew of no right except might and of no law except that of intimidation and violence" ([64]; cited by [1], p. 40).

While this is presenting the usual progressionist historical view of the Middle Ages as nasty, brutish and uncivilised, and Evans rightly criticised Ménebréa for that, there is however the germ of an anthropological, structuralist argument here, in

the emphasis on symbolic actions. In such actions we encounter the anthropological concept of *pollution*, a person, object or event that needs to be rectified by expiatory actions, hence culturally specific rituals.

The seminal text here is still Mary Douglas [65]. For example, the Nuer people regard monstrous human births as if they were in fact baby hippopotamuses, which were accidentally born to humans, and this labelling justifies their return of the disabled child to the river where it "belongs" ([65], p. 25). Animal trials could then be seen as a form of ritualistic actions to remove pollution from the community. This view was supported by Paul Berman, who used a functionalist interpretation of the prosecution of animals, whereby animal trials (as well as of course trials of human persons) were a form of legal performance that helped "explain and understand chaotic and destructive events caused by nonhuman actors" ([11], p. 291). Jesse Elvin [66] took a similar position, arguing that animal trials were the product of a search for order and comparing them with a well-known contemporary criminal law case in Britain, that of the murder in 1993 of the infant James Bulger by two equally minor children, where tragedies are defined as the consequence of culpable conduct. Such legal proceedings were not just about establishing the truth of an event in a forensic fashion (enquiring who did what, when and where), but they enabled society to regain a satisfying feeling of order and to cultivate a common sense of lawfulness ([11], p. 293), in which case they held similar ritualistic functions as the measures used to expiate pollution described by anthropologists.

In addition to such theories, Evans believed that the medieval mentality perceived of animals as agents of either God or devil, and that their actions therefore carried the potential for pollution. Such a belief was still prevalent in 1893, when a German canon law text on exorcism stated "that a spot, where a murder or other heinous crime has been committed, if the said crime remains undetected or unexpiated, is sure to be infested by demons" ([1], p. 6; referring to [67]). This is a direct cultural connection to the ancient Greek notion that pollution by crime (e.g. the *miasma* of murder) would arouse the furies and bring pestilence unless properly expiated, a theme notably covered in the drama by Aeschylus, *Choephori* [Libation Bearers], line 395. In ancient Greece certain inanimate objects, too, such as weapons or falling statues which had injured a person were required to be tried at the Athenian Prytaneion law court according to judicial proceedings termed *apsychôn dikai*, prosecutions of lifeless things ([1], p. 172; [68], p. 152 and [69], p. 285). For a medieval example of pollution that needs to be cleansed one may look to the Council of Worms, which in 864 decreed that bees which had caused death by stinging should be suffocated in the hive, otherwise the entire contents of that hive would be demoniacally tainted ([1], p. 9).

None of this appears to figure any longer in our own times. Modern attitudes towards (domestic) animals have been categorised by John Bradshaw as:

- Humanistic: interest in and strong affection for individual animals (i.e. pets)
- Moralistic: concern over treatment of animals; opposition to cruelty and unnecessary exploitation of animals
- Aesthetic: focus on the artistic qualities of animals

- Symbolic: belief in animals' spiritual significance (e.g. as embodying human souls)
- Utilitarian: use of animals for material commodities (e.g. meat, hide) or specific tasks (e.g. guarding, vermin control)
- Dominionistic: appreciation of animals for the satisfaction derived from controlling them, often in sporting or competitive situations
- Naturalistic: interest in and affection for wildlife and natural habitats
- Negativistic: active avoidance of (certain) animals due to dislike or fear ([62], p. 11).

The same animal can mean different things to different people, or to same person in different situations, so that naturally there is potential overlap. However, although these categories suit modern concepts very well, they are insufficient for explaining the medieval (and pre-modern generally) practice of animal trials, since even the symbolic attitude combined with dominionistic does not contain the strongly anthropomorphising elements in these trials.

Animals and humans were in many ways believed to be similar, according to medieval natural philosophy, in that both shared in the vegetative (nutrition, growth and generation) and sensitive (movement and apprehension) powers of the soul ascribed to living beings, but only humans were meant to possess the rational powers of the soul (intellect, will and recollection). Animals, for instance, were believed to live in a permanent present, as a scientific and medical text of about 1200 makes clear:

> Man differs from other animals because animals only have knowledge of the present, but man has knowledge of present, memory of the past, and conjecture about the future (*differt homo a ceteris animalibus quia illa habent solum scientiam presentium, homo vero habet scientiam presentium, memoriam preteritorum, coniecturam futurorum*, Question B 23 in [70], p. 14)

The implications of this extend to questions of culpability. Without memory of an action, how can a person (or animal) be tried for alleged criminal behaviour? This is exactly the legal conundrum noted by Borch-Jacobsen [20] and cited above, with regard to establishing "the truth" in judicial proceedings.

To establish culpability in a legal procedure, evaluation and consideration of the behaviour of the accused are important. On animal behaviour, Evans had already noted that animals "feel guilty":

> It is likewise undeniable, that domestic animals often commit crimes against man and betray a consciousness of the nature of their acts by showing fear of detection or by trying to conceal what they have done ([1], p. 35)

The key word here is *consciousness*. Consciousness implies knowledge or awareness of something, without which action and reaction are impossible. Both animals and intellectually disabled humans, due to their perceived lack of rationality, are regarded as, in that sense, *un*conscious.

Such a view may be found in Thomas Aquinas, who was of course heavily influenced by Aristotelianism. Aquinas had subscribed to the notion that "no animal

devoid of understanding can commit a fault (*nec enim potest animal injuriam fecisse quod sensu caret*)", cited by [1], p. 5; for the enormous impact of especially Aristotle's zoological work, see [71]. The medieval Latin word *sensus* did not mean a sensory faculty, but implied intelligence, rational sense, even moral sense. The lower animals were "creatures coming from the hand of God and employed by him as agents for the execution of his judgments" ([1], p. 54).

However, Thomas Aquinas, in *Summa Theologiae* had also asked: is it permissible to curse irrational creatures (*utrum liceat irrationabiles creaturas adjurare*) (*Summa Theologica*, Part 2 (Second Part), Question 76: article 2 [54], cited by [1], p. 53)? Normally, according to medieval theology and canon law, curses and blessings can only be pronounced on those beings that are susceptible of receiving evil or good impressions that is sentient and rational creatures. But Aquinas qualifies further, positing that curses or blessings may also be laid upon irrational creatures and insentient things, in their relation to rational beings "so that the latter are the objects ultimately aimed at and favourably or unfavourably affected" ([1], p. 53). Animals as foil to human beings were of interest to Aquinas, since although both animals and humans were *animalia,* that is living beings possessing senses, they were different in their capacities ([72]; also [73]).

Most medieval natural philosophers and theologians held that animals had no (rational or immortal) souls, but there were a very few dissenting voices. Adelard of Bath (died c.1142) considered the souls of animals in question 13 of his philosophical conversations with his nephew, *Quaestiones naturales*. As emphasised by Pieter de Leemans and Matthiew Klemm, in their discussion of Abelard, he pointed to the kind of decisions that animals make based on their sense perception, such as the ability to recognise immediately their own master ([74], p. 160). From this Adelard concluded that animals have the power of discernment, in this case discerning between different beings not of their own species, namely humans who are either neutral or their masters. And as discerning, sentient beings their souls are also immortal (see [75]).

In the thirteenth century William of Auvergne possibly held similar views on the possibility of salvation for animals ([74], p. 160).

In this regard, Evans raised the important point, perhaps lost to medieval theologians or deliberately obscured, that if animals are treated as rational or sentient beings, then that

> involves the immortality of animal souls and necessitates some provision for their reward or punishment in a future life. If they are capable of merits and demerits and can incur praise and blame, then they are worthy of retribution hereafter and there must be a heaven and a hell prepared for them, so that the pre-eminence of a man over a beast as an object of God's mercy or wrath is lost ([1], p. 67)

Or, as was not uncommon in medieval culture, the learned doctors of the church and canon lawyers saw no contradiction in what, in strictly logical terms according to modern thinking, would have been incompatible—medieval people were quite capable of accepting two contradictory truths simultaneously. This trend can be seen in the tension between faith and reason, especially as applied to the interpretation

of Scripture and other religious texts. Hugh of St Victor in the twelfth century noted that literal readings of texts may produce contradictions, and wrote about this in his *Didascalion*:

> Even so the Divine Page, in its literal sense, contains many things which seem both to be opposed to each other and, sometimes, to impart something which smacks of the absurd or the impossible (see [76], p. 140)

One may further observe such notions in the anthropomorphising treatment of animals, both good and bad, with the animal trials presenting perfect examples. In 1403 the deputy bailiff of Mantes and Meullant presented a bill, dated 15th March, regarding the expenses incurred for the imprisonment and execution of a sow who had killed and devoured a small child:

> Cost of keeping her in jail, six sols parisis. Item, to the master of high works [i.e. the executioner], who came from Paris to Meullant to perform the said execution by command and authority of the said bailiff, our master, and of the procurator of the king, fifty-four sols parisis. Item, for a carriage to take her to justice, six sols parisis. Item, for cords to bind and hale her, two sols eight deniers parisis. Item, for gloves, two deniers parisis (cited in [1], p. 142; original French in Appendix I, p. 338)

The total cost of executing an infanticidal sow with all the accoutrements, pomp and ceremony due to a human execution amounted to sixty-nine sols eight deniers parisis. Executions of pigs under similarly solemn circumstances are also attested in France for Labergement-le-Duc in 1419, Brochon in 1420, Trochères in 1435 and Abbeville in 1490 ([1], p. 157). In a similar case from 1408, the pig's jailer charged two deniers a day for board and upkeep, "the same as for boarding a man, thus placing the porker, even in respect to its maintenance, on a footing of perfect equality with the human prisoners" ([1], p. 143). The contrast with owners of animals being legally not responsible for the misdemeanours of their animals and with parents or guardians of minors or intellectually disabled persons who also did hold legal responsibility for their charges becomes apparent in a further case from France. In 1499 the bailiff of the Abbey of Josaphat near Chartres imposed a fine on Jehan Delalande and his wife, because of "the murder of a child named Gilon, aged [one] and a half years or thereabouts, perpetrated by a porker, aged three months or thereabouts" (cited by [1], original French in Appendix N, p. 352). In his translation, Evans incorrectly gave the age of the child as "five and a half", which would have been highly unlikely that a five-year-old could have been killed by a barely fully grown pig. The small child had been left in the care and keeping of the Delalande who owned the homicidal pig, and they were held culpably negligent of the child but not responsible for the actions of the pig. The pig therefore was deemed to have autonomous agency.

When it came to hypothesising why medieval legislators prosecuted and punished these irrational animals, Evans reflected on the difference between "modern", that is according to the situation around 1900 when Evans was writing, and medieval causalities of crime. Modern crime was caused by "manifold evils afflicting society and threatening to subvert it", largely due to the tensions between "the selfish and unscrupulous power of wealth directed and stimulated by superior

intelligence and energy, on the one hand, and the brute forces of ignorance driven to despair by the disheartening and debasing pressure of poverty, on the other hand" ([1], pp. 230–231).

One may note how the possession of intelligence, here misused by the greed of the wealthy, is contrasted with the ignorance of the poor, a statement undoubtedly in keeping with late-nineteenth-century views on intelligence, mental incapacity and disability more generally. Nonetheless Evans argued that a lot of crime "springs directly from the unjust and injurious conditions of life, which society itself has created" ([1], p. 231). This socio-psychological view he contrasted with the medieval one. Medieval legislators "regarded the criminal, both human and animal, as the sole author of the crime, ascribing it simply to his own wickedness and never looking beyond the mere actual deed to the social influences, psychical and physical characteristics and inherited qualities, that impelled him with irresistible force to do iniquitous things" ([1], p. 231). It is here that the legal history of "idiocy" can show that Evans was wrong about medieval laws, since medieval (and antique) legal codes without exception treated persons we would now label as intellectually disabled as irresponsible and therefore inculpable for their actions.

8.5 Conclusion

All three categories of beings (children, intellectually disabled, animals) are regarded as pre-speech or non-speaking, as *alogon*, and as irrational. However, whilst medieval laws recognised the importance of rationality for establishing culpability generally in all cases, the first two categories of children and the intellectually disabled were not punished, yet the third category of animals sometimes were. Having reviewed medieval notions concerning logic, rationality, intellect and will, the essay will attempt a speculative resolution of this contradiction. Intellectually disabled persons (as well as children) are part of the natural order, according to medieval thinking, despite their intellectual failings. As something natural, their failings and resulting misdemeanours or "crimes" are deemed inculpable. Animals and especially domestic (or domesticated) animals are of course also natural, but according to medieval Christian doctrine stand in a subjugate relationship to humans, ever since Adam named them and claimed them as his dominion in the Garden of Eden. This is the passage in Genesis 2:19–20, also more (in)famously the passage in Genesis 1:26: "let them have dominion over over the fish of the sea, and over the fowl of the air, and over the cattle, and over all earth, and over every creeping thing that creepeth upon the earth". Animals must therefore not be harmful. Murderous or injurious animals, however, might then be regarded as an infringement of this natural order. If animals are deemed culpable, so that a purifying ritual in the form of judicial proceedings must be carried out, then that restores the correct order in the most civilised fashion available to medieval society, the rule of law.

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Chapter 9
Natural Logic and the Course of Time: From Theology to Developmental Psychology

Christopher F. Goodey

Abstract The modern human sciences assume a fixed relationship between logic and the place of human beings in the natural order which have sprung from an emerging notion of *correspondence* between the externality of logic as system and the human being's subjective logical abilities. Although this notion has evolved over many centuries, its onset was historically specific and can be located in medieval Christian thought which made "Man" the primary illustration for demonstrating the syllogism. First, this evolved so as to contribute to the birth of the study of "Man" in the modern human sciences. Secondly, it was accompanied by a re-definition of the human interior in terms of linear time, with the possibility of salvation as its end or goal; this was structured by "stages" involving the completion or perfection of an interiority that replaced earlier, static definitions of the human essence. Precursor notions for psychological "development" accompanied the interpenetration between logic and theology in the sixteenth and seventeenth centuries. The fundamental intra-human divide between "elect" (saved) and "reprobate" (damned) in the theory of predestination began to overlap with that between the scholastics' "rational animal" and the non-logical other. The placing of a subjective logic within this fundamental division remains subliminally in foundational human science texts such as Locke's *Essay* and Rousseau's *Emile*. Thus it was from distant roots in natural logic that it, and modern psychology in particular, called in question the full humanity of two groups: children in general, and adults deemed "developmentally disabled."

Keywords Natural logic · Predestination · History of the human sciences · Psychological development · History of psychology · History of childhood · History of religion · History of logic

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9.1 Introduction

I will discuss here the relationship between logic and the place of human beings in the natural order. "Logic" will often indicate certain ways of perceiving logic or appropriating its terminology. My end-point will be their influence in the modern human and social sciences, from which I take the psychological notion of "development" as my example.

Large areas of the human sciences rest on an absolute presupposition that runs as follows. On the one hand, there is logic as a set of formal, external procedures which somehow exists out there—almost as if untouched by human hand. On the other hand, there is logic, or logical reasoning, as the most refined capability of the human subject. There have been various ways of expressing this in the past, notably as the division between an "artificial" and a "natural" logic. Although it is often acknowledged now, especially for a fraction of professional logicians or in the general opinion, these two faces of logic are strictly separate from each other, in the human sciences they are also seen as somehow corresponding with or "complementing" each other ([1], pp. 1–20). This is then used to justify scientific notions of order in human life: that is to say, the classification of the human species within nature as a whole; the sub-classification of human groups; and the interior order of the individual. This latter is seen as cognitive, though before the modern era it tended to overlap with the emotional and especially the moral, in the separation of all three from the will.

This absolute presupposition is embedded in law, education, ethics, economics, social policy, and the public sphere generally. By its own reckoning, such a principle ought to transcend history.

9.2 Man the Rational Animal, Aristotle to Avicenna

One way of claiming cross-historical validity might be to discover primitive precursors, the Greeks being the usual suspects. So when one refers to the axiom "Man is a rational animal," one claims to be citing Aristotle. But Aristotle said no such thing. Some passages are referred to as if they were saying: "It is the essential property of man to be a living creature receptive of reason," as in *Topics* ([2], Aristotle/Forster, 138a35) and *Categories* ([3], Aristotle/Cooke, 7a38). However, and first of all, in both cases, we are not faced with a thesis defended for its own sake by Aristotle, but an *endoxon*, a commonly accepted but provisional statement that will work for the sake of argument. Secondly, Aristotle is illustrating in this passage of *Categories*, dedicated to relatives, the variety of different ways in which categories can relate to each other, by contrast with the crude binary model of pre-Socratic logic that could not get beyond positive and negative. The statement in question says simply that the fact that being a master and having an ability for reason (*épistémè*) (and being a man) is observed in the very same substance is accidental to the topic at stake,

namely the master/slave relationship. The two elements can be spoken of in the same breath: that is, if we are employing them as conceptual categories. It says nothing, however, about the human subject, about human beings possessing reason, or about their being "receptive" of reason (or worse, "capable" of reason) in the sense the modern psychology would understand the word. The Greek word Aristotle uses comes from the verb *dekhesthai*, "to receive." Although "receptive" is thus at least faithful to its Greek origin, Aristotle uses a very rare participial inflection of it, *dektikon*. The only other place where this inflection can be found is in a small number of pre-Socratic texts on the underlying principles of mathematics [4]. This tells us that Aristotle understood the word in some similarly non-psychological sense, that of a purely formal logic. In *Topics* ([2], 138a38 *sqq*.), the notion that reasoning (*logizesthai*) would be a property is indeed considered, but it would be a property of the reasonable part (*logistikos*) of the soul, not of men; furthermore, the statement is inserted in a paragraph designed to provide strategies for actually *rejecting* such a statement.

Aristotle might give the impression that he interpolates a psychological note at the very end of the *Posterior Analytics* ([5], 100b15) when he says that the first principles of syllogizing in demonstrations come from *nous*, the intuited intellect. But *nous* is not something that is specifically human, nor does he try to connect this to the account of how syllogisms actually work.

Then Aristotle was rewritten by others. Medieval writers obtained their ubiquitous phrase "Man is a mortal, rational animal" not from Aristotle but from the introduction to Aristotle's *Categories*, the *Isagoge*, written by the Neoplatonist philosopher Porphyry in the third century AD [6]. In Porphyry's Greek, the word later translated as "rational" is *logikos*. Porphyry's formulation resembles more closely the reported remark of the pre-Christian Stoic philosopher Chrysippus that "Man is a rational [*logikos*], mortal animal" ([7], 2.8–11). In any case, the word *logikos* referred neither to syllogistic logic (a *logos* could be sound or unsound) nor to human interiority. It does not even refer to the essence of men, even though "rational" is a "substantial difference" of man, since in Porphyry's system of division, it takes two substantial differences to specify one type of reality, there being also immortal rational realities (celestial bodies).

In the early universities, it was Porphyry's Latinized text that formed the indispensable introductory handbook to the logic curriculum and to Aristotle in general. This ensured that the medieval philosophers read Aristotle through Porphyry's spectacles. However, we are already in the thirteenth century AD. The late medieval thinkers, unlike either Aristotle or even Porphyry himself, are by now seeing a positive relationship between logic as system, and its place among human beings in nature. The formula "Man is a rational animal" is now a truth inscribed in the chain of being.

This creates a problem. When you illustrate a formal procedure using the word "table," no reflexivity is involved. There is clear blue water between the structure of the logic and the empirical illustration. Tables do not do logic. And tables do not reflect on their own natures. So the objectivity of the formal procedure is not compromised. When Aristotle himself had written about the syllogism, the word "man"

operated no differently from words like table, or house, triangle, ice, cloak, etc.—all these things were of equal status. "Man" was as extrinsic to the formal workings of a syllogism as "table" was. When Aristotle wrote about other things, about ethics, for example, he did suppose that human beings have a special place in the world. But in his rules of logical engagement, a human being was no more significant than a table. The medieval thinkers, however, allowed both the essence, and even more confusingly, the nature of the human to become entangled in the fixed external rules of logic. A convention arose, for making "man" the paradigm case of a universal. And this convention arose because human beings, with their material and rational duality, were now positioned midway up the *scala naturae*.

It should be noted here that Porphyry's predecessor, Alexander of Aphrodisias, though not a direct influence, had already begun to naturalize "rational animal." Like Porphyry, Alexander sometimes smuggled Stoic ideas within the primary purpose of interpreting Aristotle for an elite contemporary audience. Aristotle in his *Metaphysics* had asserted that abilities are things that can come and go; therefore they cannot be classed as the essence of anything, because they are not stable enough ([8], 1019a). Alexander effectively contradicts this. He links the unique place of human beings in the order of the universe to the reasoning capabilities of the individual: his assertion that the essential property of man is "to *possess* reason" is in fact more naturalistic than Porphyry's ([4], 173). This itself could then be expressed as a logical proposition. Avicenna is another illustration: he states, for example, that the human being's place in the universe is the "necessary consequence" of his essence, the proposition now being: "If this thing is a rational animal, then it is a man" ([9], 40).

So during the late Middle Ages and on the threshold of the early modern era, and only then, the question would arise: What if the premise is false? What if some animal looks human physically, but is not rational? I am not talking about irrationality in the diffuse sense employed by psychiatrists and critical theorists alike, I am talking about a deeper hypothesis: that there are some human-*looking* creatures that truly are not human in the first place—even though they are part of nature. We call them human out of mere courtesy, and with modern biomedicine and technology we look for ways of eliminating them. More specifically, it is possible to trace a line from the medieval definition of man as a rational creature to the modern concept of cognitive ability and disability, in which the very starting premise is the existence of a scientifically observable distinction, between a population of normal intelligence or above, and an abnormal group which challenges the cognitive rule about what it is to be human.

9.3 Natural Logic, Election, and Predestination

By the middle of the sixteenth century, philosophers themselves were losing interest in logic. But new roles for it were being created, based partly on a clearer delineation of such exceptions to the rule. Historians have noted the rise of what they

politely call a humanist logic. But what this actually meant was that professional and bureaucratic elites were taking logic seriously and adapting it to changes in social organization. They took the presupposed correspondence between logic as form and logic as the supreme ability of the human subject, and they used it to enhance their own expert status. Although this was a degradation of philosophical logic, or perhaps *inasmuch as* it was a degradation, it would prove crucial to the birth of the human sciences, and of psychology in particular. In short, it was a degradation that would build its own intellectual apparatus.

Two significant names in this respect are Petrus Ramus and, for a later period, John Locke. The medieval philosophers, following Aristotle in this respect at least, had always defined the human being *in toto*: "*Differentia* and substance are predicated of their subjects univocally … not in degrees of less and more. No man is more man than another man" ([3], 3a333, 3b37.). However, it would be through humanism and the subsequent influence of writers like Ramus, Locke, and others that one human being did become, both in essence and in nature, more than another, or perhaps was not human at all. This ate away at the medieval theological principle, spread above all by Aquinas, that the rational soul was infused directly by God in every human embryo. It also provoked new, polygenist and racialist theories about the biological origins of humanity.

Early professional elites used logic as a tool to define questions of status: the relationship between human beings and God, between human beings and other species, and especially between one human group and another. The surface vocabulary of logic objectivized status in the form of prescriptive accounts of behavior and intelligence. It justified the permanence of existing social relations, and promoted an air of authenticity and authority that would then become the authenticity and authority of the human sciences.

This ersatz logic came in two forms, one juridical or broadly social, the other religious. Firstly, the middle ages had seen the rise of the *literati* as a social caste who represented the final triumph of a written culture over an oral one and who administered the expansion of jurisprudence and bureaucracy. Secondly, and subsequently, the disputes ignited by the Reformation encouraged a systematic, detailed monitoring of the individual's interior life. These two historical patterns would at some point combine.

Vernacular logic books started appearing in the mid-sixteenth century. In England, the most popular was Thomas Wilson's [10]. For the next century, this was the first book an educated person looked at when they wanted to know about logic. Wilson's first and paradigmatic illustration of a universal is, "Man is a rational animal." He spends the rest of the book describing that rationality in terms of the everyday intelligence and ingenuity required by the obedient professional classes. It instructs the gentleman on how to behave towards his superiors (including God), towards his peers, and towards his inferiors. In substance, then, it is already a psychology self-help book. But it remains also a logic book, inasmuch as the opening section about the rational animal is organic to what follows. It is not some detachable rhetorical flourish, but a launching-point for logic's ancillary career in organizing our knowledge of the human interior.

Wilson's book coincided with the Ramist revolt against scholasticism. Ramists disliked the complexity of its distinctions, and sought a simpler system, based entirely on the strict division and subdivision of universal kinds. As part of this simplification, the category boundary between possession and privation became sharper. In medieval logic, privation had come under the heading of "accident." Accidents did not challenge essence or species membership. It is easy to suppose that for the new humanist logicians, lack of logical reasoning in an otherwise human-looking creature might prove more problematical.

Writers with a Calvinist background like Wilson, having ostensibly gone down the route of (medieval) Aristotelianism, drew equally on Ramism, and by the end of the sixteenth century, ecclesiastics (and lawyers) were fixing human category boundaries more firmly with the aid of both traditions indiscriminately. One upshot of this comes in early modernity's increasing fixation on "abstraction" as the supreme cognitive function. They drew for this on medieval philosophers who had already promoted their own theory of the abstraction of universals from particulars, by referring back to Aristotle. The connection is again somewhat ill-fitting. To call this theory Aristotelian is indeed correct, because Aristotle did in fact discuss it in roughly similar terms. However, he makes only a sketchy theoretical case for it. If you look for the verb "to abstract" in the medieval Latin translations of the Aristotelian corpus, you may find the Latin verb *abstraho*, but you will not find the equivalent in Aristotle's Greek because there no such word existed; he had simply used a random selection of half a dozen everyday terms such as to remove, to lift off, to take away, and so on. Abstraction was simply what a few ancient philosophers happened to do when they got together.

The late medieval theory of abstraction foreshadowed the circularity between external and internal logics that characterizes the psychological operations of the modern human subject. But it really owes its modern profile to the arrival of bureaucratic expertise in written archiving and record-keeping in the late middle ages. The professional rationales of the medieval *literati* were the model for describing the interiority of logical reasoning. Filing, that is to say the sorting of single recorded items under general headings, turns up in the human mind as the sorting of particular conceptual items under universal headings. From the thirteenth century onward this also became instrumental for newly educated clergymen in the performance of newly practised pastoral duties (confession and penitence), in which congregants were invited to order and classify their sins under a hierarchy of headings.[1]

What then, about people who could not perform abstraction or logical reasoning? The *literati* already had a term for them: the Latin word was *idiota*. This simply meant a lay person, a non-expert—that is, the majority of the population (or, within the monastic orders, the lay brethren). The word was not some analogy drawn with a pathological category of the cognitively disabled, because no such category had

[1] I am very grateful for the suggestion of Julie Brumberg-Chaumont here, and at several other points.

yet been invented. An *idiota* was simply a *non-literatus*—not even unable to read, but possibly unable to read Latin ([11], p. 29).

In religion, the conceptual distinction was more fundamental. It came from the divide between the elect and the reprobate. Even before they are born, God has determined for every individual whether they are going to heaven or to hell. There is nothing the individual can do about it. And unsaved reprobates, like idiots, are the majority. So how could you know if you were one of the few destined for salvation?

Many Reform theologians, coming from a humanist tradition, appealed to logic. Historians have noted how Calvin and Melanchthon applied logic to religion [12, 13]. However, the matter could equally be seen as an infiltration of logic by religion. Calvin's answer to that question about whether one is elect or not had been that one can infer it from one's inner sense of certainty. There was an implicit syllogism in this, increasingly evident among his later disciples: the elect are certain of their salvation, this man is not certain, therefore he is not elect. One might think that they were adapting, for religious purposes, some already existing logical proposition, let us say: "Man is a rational animal; this man is not rational; therefore he is not a man." However, the latter conclusion would have been unthinkable in Calvin's time, and it would be another century and a half before Locke formulated it.

And here is the important point: Locke could not have conceived of saying that a man without logical reasoning was not a man, if the Calvinists had not previously said that a man without certainty was not elect. We have cognitively normal people, in part, because we once had the elect. The search for certainty about elect status contributed much to the later rise of a supposedly objective science of the human mind, as well as to the rise of an epistemological emphasis more generally.

There were certain landmarks on this path from Calvin to Locke. Theologians were attracted to Ramism because it helped them to demonstrate that if "man," as a natural kind, is the paradigm case of a universal, then elect and reprobate must be the first and main subdivision under that heading. They tried to show the benefit in having logic and religion sit alongside each other. The Calvinist theologian William Perkins, famous across Protestant Europe in the late sixteenth century, drawing on the Italian Protestant Girolamo Zanchi, juxtaposes the proposition "Every man is a creature endowed with reason," with the proposition "All the faithful are elect to eternal life" ([14], p. 23). They are, he says, analogous examples of how logic can frame religious proofs. Of course, he still assumed that every human being is not elect, whereas it was the case (according to the existing initial formula) that every human being is a reasoner. Nevertheless, analogy can lead to osmosis.

There was also broad agreement that when God does give grace to an elect individual, as the means to salvation, it lodges directly in the psychological faculty of the understanding. And so some theologians identify the very content of the human understanding with the content of the elect state: there is a one-to-one fit. In the mid-seventeenth century, the Calvinist William Bridge asks: if the "essential property" of man on the scale of nature is to be "rational animal," then what is the content of that rationality? His answer is: "the ability to reflect upon a man's own actions, which a beast hath not." And it is on these grounds that he then excludes from the human species all those who will turn out to have been reprobate, because "therefore

they do not have the essential property of rational animal" ([15], p. 7). The cognitive out-group is now classified with animals not merely rhetorically, as a majority of medieval philosophers had frequently done, but in terms of a logical schema that starts to align itself with some sort of natural history.

Locke is the next stage on from this. His *Essay concerning Human Understanding* is a founding text of modern psychology, but he himself described it as "another sort of logic," a "logic of ideas" that would enable the final resolution of theological differences. In this respect, he was perhaps trying to improve upon the *La logique ou l'art de penser* of the Jansenists Antoine Arnauld and Pierre Nicole. Locke himself was raised in the Calvinist tradition, which was similar to the Jansenist Catholicism of Arnauld and Nicole, at least in its insistence on the importance of categorizing the interior nature of human beings, by reference to who was elect and who remained reprobate. Locke is usually assumed to have rejected, despite his upbringing, the idea of election and reprobation. Nevertheless, the one explicit reference in his output to the issue suggests that he purposely ignores it, rather than discarding it ([16], 625) He admits that he cannot solve the contradiction between his famous "tolerant" principle that the individual must find his own way to God and his equally deeply held belief in an all-powerful God who can determine an individual's afterlife destiny. In short, the need for a distinction between sheep and goats remained existential. He replaces the elect-reprobate division with his own division, between what he calls the "moral man," and the "changeling" or elsewhere, the "idiot." The moral man is a prototype of what modern psychology calls the person of normal intelligence, defined by their capability for the empirical acquisition of reason. The idiot was anyone incapable of empirical learning, and thus a prototype for the modern cognitively disabled person. And close textual examination shows that there is a strong similarity here between the descriptive characteristics of Locke's of "moral man" and "changeling" and the "elect" and "reprobate" categories described by certain theologians of the period. He cuts out their labels and pastes in his own new ones, but some of the underlying sense remains.

Moreover, it is precisely in this context that Locke presents his own theory of universals, resting on the notion of nominal essences. As usual, almost the only illustration he uses is "man." And man's nominal essence is his ability to abstract, or to sort species, on an empirical basis. Thus the definition is regressive: the nominal essence of the species man is his ability to understand that the nominal essence of the species man is his ability to understand that the nominal essence of man is his ability to … etc. The correspondence between external logical order and interior logical reasoning becomes circularity. And the creature who looks human physically but who is unable to jump on this merry-go-round is *ex hypothesi* not human. "The Moral Man," or simply "Man" *tout court*, means nothing but a "corporeal rational creature," which "a child" or a "changeling" who "has lived forty years tougher without any appearance of Reason" clearly is not ([17], 3.2.16; 4.4.13–14). At this historical juncture, just when logic, in support of scientific method, was sinking roots in the hard sciences, the formative role of logic in the human sciences was emerging from salvation theology.

9.4 Natural Logic as a Developmental Entity

I have suggested that historical appropriations of the language of logic lend to accounts of human interiority its sense of order. I will finish by singling out one particular strand of this in the human sciences, through the notion of "development" as it has emerged in modern developmental psychology.

According to the modern father of developmental psychology, Jean Piaget, it is development over time that constitutes the very substructure of what he calls "mental logic" in the individual. Medieval faculty psychologists noted only, and then only rarely, the relative time it takes for the imagination to receive sense impressions and transmit them to the faculty of judgment. Descartes and Hobbes wrote about chains of ideas, but they did not worry about how long it takes to get from one link in the chain to the next. The question is how did this psychology get transformed into the modern discipline's central idea of the human being as a "developer"?

In fact, the core of the developmental narrative was already present at the start of monotheistic religion. Christianity abandoned the cyclical time of pagans and Stoics in favor of an irreversible trajectory. At the end of this trajectory lay redemption and perfection. Interior pilgrimage was first outlined by Irenaeus in second century AD [18], then elaborated by Augustine in his Six Ages of the world, the Seventh being the afterlife ([19], p. 80). This is reflected in the medieval jurisprudence that assumed age-related levels of competence (7, 14, 21, though in these "stages" the social history runs ahead of the intellectual history [20]). Modern developmental psychology, in which *homo psychologicus* progresses through interior stages from infancy through childhood and adolescence towards its own kind of perfection, namely normal adulthood, is the final vindication of St Augustine. Both belong to one and the same historically specific mind-set which sees the human essence as interiority structured by linear time. And this linear time points towards a goal that is both collective and inscribed within the individual.

The developmentalist account of what it is to be human takes a certain kind of creature hostage. We call this creature the child. If the time taken for an interior "mental logic" to develop is linear, this makes children a separate natural kind (an accusation already being made against certain theologians in the mid-seventeenth century). Or we could say, children are a sub-species of temporary idiots (as once women were). After all, cognitive disability is more or less synonymous with developmental disability. The difference between developmental disability and the state of childhood only becomes clear after the first two decades of existence, when the young hostage finally pays the ransom by "fulfilling their potential."

It was again the seventeenth century's obsession with election and reprobation that reinvigorated the temporal model. Doctrine stated that everyone without exception is born reprobate; the elect are simply those few who are rescued by the receipt of grace. Grace arrived at a certain point during their earthly life, at a point that was initially conceived as being irrespective of age. This life-changing event could be envisaged in two ways. In the first, the arrival of grace is instantaneous, a single lightning strike. In the second, it is gradual. Gradual, however, did not mean

continuous. Such a profound transformation over time involved both a new content and a new metaphysics. In terms of content, there is regeneration, followed by justification, followed by sanctification: distinctive stages which arrived with Thomism but which did not form a temporal sequence until Luther and Calvin. The gradual receipt of grace was not *purely* gradual, it was discontinuous. It involved qualitative leaps from one stage to the next which could only happen through incorporation of all the preceding stages: baptism, regeneration, justification, and sanctification.

The gradualist account of election is still a deterministic one. There remains a blind arbitrariness that picks out this or that individual for salvation regardless of how well or badly they have led their lives. Moreover, gradualism extends the scope of determinism still further, by invoking a more general lawfulness which governs those changes in the interior life. It prescribes these changes as a series of points in time before which certain things cannot happen, and after which they really ought to have happened or the next point will never be reached. In this sense, the obvious precursor to modern developmental psychology is that other founding text (alongside Locke's), Rousseau's *Emile*. With its central concept of "order," this text represents both the culmination of an already existing tendency in Christianity, and the first modern expression of it as developmentalism. As the model pupil in Rousseau's theory of education, Emile is both the last holy child and the first normal child.

Locke's empiricism had enhanced the importance of childhood. But the most important influences on Rousseau for our purposes were Pascal and Malebranche. The concept of order in all three authors is not at all similar. But what their respective concepts do have in common is their emerging temporal emphasis, and the associated manner in which they subsume their notion of logic under that of order (they were all abusive about logicians, but of course that meant scholastic logicians). Pascal had written in the *Pensées* that the earthly life consists of three mutually exclusive orders: the order of flesh, the order of minds, and the order of charity (love of God and one's fellow-humans). The idea of their mutual exclusivity seems to imply a spatial arrangement. But these orders also have a temporal trajectory, inasmuch as in representing a hierarchy of values they also suggest a relay—from flesh to mind, from mind to charity, or from flesh straight to charity—and the final arrival at the Christian republic, consisting of all of the elect (both alive and dead). When Pascal wrote about his three orders being mutually exclusive, it was nevertheless by analogy with the mutual *exclusivity* of points, surfaces, and planes in mathematics. And inasmuch as the analogy is geometrical, spatiality predominates. In *Emile*, the mutual exclusivity of orders re-emerges as temporal *discontinuity*. The path from Pascal to Rousseau is of course a long one, and by "orders" Pascal meant something like earthly vocations. But he was interested in Order in the grand sense too, social as well as religious, and the need to take into account its temporal unpredictability [21]. Rousseau's order and its specific differences exist in time rather than space: the developing individual must not and cannot leap over the prescribed chronological stages. He must not eat the fruit of the tree whereof he has been commanded not to taste—at least for the time being.

Whereas for Pascal the end of this temporal trajectory lay in a Christian republic, for Rousseau it ends in *le Bonheur*. This term was common enough currency by the

eighteenth century, but it is important to understand that at its origins it was synonymous not merely with salvation but with the elect status that preceded it: it was *le Bonheur des bienheureux*, as Malebranche had put it: the happiness of the blessed, and blessed because they are elect.

Pascal had been an associate of the Jansenists, a Catholic sect whose belief in election and reprobation was not dissimilar to the Calvinists. There was one big difference, nevertheless. Calvinists were anxious about how you could be certain you were elect, but they did largely believe that once election was granted it remained constant. The Jansenists' anxiety, by contrast, was that you could relapse from elect status. And the more often you lapsed, the harder it was to resume that status. Interior growth in this sense happens almost despite itself: it consists in a kind of pushback, against the inevitable disorder and seeds of degeneration nurtured by the Devil.

Moreover, although Pascal is actually famous for promoting faith over reason, the positive albeit secondary value he does attribute to human reasoning is constituted precisely by this quasi-developmental force. Like the Jansenist authors of the *Logique de Port Royal* (in whose writing he had co-operated) he had been a tutor of the younger children of the elect. The Jansenist founders of Port Royal's *petites écoles* clearly believed that a secular curriculum was a better aid to preserving their elect purity than religious instruction was ([22], p. 414). Rousseau would likewise warn that religion is only for grown-ups.

Emile is Rousseau's answer to his anxiety about election. In his *Confessions* ([23], p. 236), he describes being severely depressed as a young man about whether he was saved or not. He recalls day after day throwing stones at tree-trunks to see if they missed or not, and with each throw asking himself "Saved? Damned? Saved? Damned?" Later in *Julie, ou la nouvelle Héloïse*, his espousal of equality would explicitly lead to rejecting the idea that grace is arbitrarily given to some but not to others ([24], Letter 7). However, as with Locke, this rejection is not quite what it seems. Grace in some sense remained a necessity, and its discriminatory powers were existentially necessary to it. Distinctions have to be maintained. If not in election and reprobation, then where? Rousseau's answer lay within nature, which had assimilated grace, and within natural religion.

In order to understand how this answer developed, we need to look also at the influence Malebranche had on him. Malebranche had proposed a transcendent law of Order whose operations are primary, encompassing both nature and grace itself. Distinctions within human nature, and their deeper causality, have to be explained by reference to this higher, unwavering lawfulness. Reason, which actually constitutes this law of order, is still positioned vertically, on the chain of being. However, God no longer divides human beings by an arbitrary rule that lies outside of nature and time. God alone remains a true cause, and that is why the maintenance of lawfulness depends on his moment-to-moment interventions. Humanity itself nevertheless has the task, over time, of re-establishing order and logic as supreme authorities on earth, as they had been before the Fall. Rousseau subsequently found a concrete place for the operations of this task within the psychological nature of the individual. He shifted the supremacy of order from its place on the *y* axis of the chain of

being, to the *x* axis of the individual reasoner's time on earth, where it takes the form of stages framing his interior progress.

In Rousseau's work, the formal divorce between logic as objective system and the subjective logic of the nascent human sciences (political, anthropological, psychological) is evident. But it is equally possible to argue that the systemic aspect of the former is now thoroughly absorbed within the latter. And this can occur precisely because in the very act of narrating his tyro's story he is also thereby situating this subjective logic, along with the ersatz rigor of its systemized structures, in a temporal dimension. In doing so, he turns it into the basis for a modern psychology, in its developmental aspect. In this shift we can see a crucial phase towards the objectivization of a broadly subjective, interior process which medieval philosophy had (somewhat differently) conceived as "natural" logic. It was acquiring the status of something "in here" that corresponded to something "out there." But the sense of linear time removed the existing barrier between inner and outer, and the "out-thereness" of logic was now reconstituted as an actual interior identity of the individual and their destiny, after death and then, from the mid-nineteenth century, on earth. Its rigor becomes that of the developmental stages; and in its sights, alongside the "developmentally disabled," are children.

Prior to Rousseau, Malebranche had seen human life as a movement from disorder to order, a gradual discarding of disordered elements. This is reflected in the etymology of the word "develop." When the word first appeared in the seventeenth century, it meant to unfold. While no doubt visualizing an end-point, it chiefly signified the revealing of some natural essence that was already present within the referent. What Malebranche refers to as stupidity and feeble mindedness (*l'esprit faible*) is the failure to emerge from disorder ([25], section 4.12). But for him, unlike Locke, this is not an exception to the human rule. It is simply what he calls "ignorance of order." It involves the will, reprobation, and the materiality of the *spiritus animales* all at once, and is therefore a property of human beings in general, in whom disobedience to God is the default condition.

For Rousseau, on the other hand, obedience means obeying the temporal structures of nature, through which alone lies grace. One must wait for the young person to leave disorder behind and thus for his true nature to reveal. If our fully human nature only unfolds over time, this unfolding has to pass moreover through a fixed chronological structure. There is no room for the *puer senex* or *enfant sage*. Attempting to progress too quickly is as dangerous as progressing too slowly. The preservation of purity consists not in pushing back against the Devil, but in following a tutor's timetabled curriculum that corresponds with the natural progress of the unfolding.

Malebranche had rejected Cartesian notions of the relationship between formal logic and psychology. God alone was the locus of logic. And as for psychology: "Of all the objects of our knowledge, only the souls of other men and pure intelligences remain; and clearly we know them only through conjecture. At present we do not know them either in themselves or through their ideas, and as they are different from ourselves, we cannot know them through consciousness" ([25], p. 239). Mere human beings, he says, can have no external science of the mind, only sensations

and experiences. Rousseau in *Emile* says that we can have such a science, as long as its order is developmental. This is a modernizing move. Piaget himself could have written the key demonstration at the end of Book Two, where Rousseau illustrates from a (rare) real-life example how the question of age is super-determinant: "the question," he says, "is precisely that of age" ([26], p. 209).

We should remember too that *The Social Contract* was only conceived as an appendix to *Emile*, which he regarded as his core achievement. Man is born free, and everywhere he is in the wrong kind of chains. Here are some new ones. But as a modernizing move, it is also a religious one: it adapts a pre-existing zealous divisiveness to its own emergent rules. In *The Social Contract*, the general will represent the will of broad social strata, but like Locke's "moral man" that probably did not include the laboring class. The same is true of Rousseau's educational philosophy. The temporal structure allows for the existence of a "developmentally disabled" category, which might also include laborers, but which most definitely includes all children. The effect of this is converse to what Rousseau himself undoubtedly saw as an emancipatory education.

There is a parallel here with Rousseau's theory of the general will, which set necessary limits on the political aspirations of the civic individual. We know that this was derived from the Jansenist theory of God's general will [27], which set necessary limits on the religious aspirations of the individual (who is born reprobate). The same derivation holds in psychological terms too. There is a seamless transition in which that group of creatures which has not yet developed, or which has developed physically without ever developing cognitively, comes to occupy the same place in the classificatory template as reprobates had previously occupied.

9.5 Conclusion

When developmental time becomes the basis for how we perceive order in human life and the human interior, the presupposed correspondence between logic in its formal sense and logic as subjective process finally becomes a short circuit. However, that is to put it in purely theoretical terms. It is important to go beyond general concepts such as power and marginalization, and to look at the categorization of human sub-groups as a detailed series of historical events, in a complex interaction between the conceptual and the social histories. Even such detailed histories only expose the method in the madness of diagnosis and categorization, not its fundamental, anxious motivations.

The impossibility of God's having saved every last individual human being has been vital to most forms of Christianity. This underlying principle survived the transition from revealed to natural religion, and then from natural religion to the modern formal disciplines of psychology. In developmental science, the relationship between logical reasoning as an interior characteristic and the logical order of the external structures that describe and monitor it finally becomes a modern, fixed entity—for the time being.

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