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JULIE BRUMBERG-CHAUMONT

SOCIAL USES OF LOGIC IN MEDIEVAL AND MODERN CONTEXTS

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... 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 “a universal universality.

— Robert KILWARDBY, *De ortu scientiarum* (ca. 1250)¹

Everyone thinks. It is our nature to do so. But much of our thinking, left to itself, is biased, distorted, partial, uninformed, or downright prejudiced [...] Excellence in thought, however, must be systematically cultivated. Critical thinking is that mode of thinking — about any subject, content, or problem — in which the thinker improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use.

— The Foundation for Critical Thinking²

JULIE BRUMBERG-CHAUMONT — Senior Research Scholar, PSL/CNRS, Laboratoire d'Études des Monothéismes, Villejuif, France; e-mail: julieephe5paris@hotmail.com; ORCID: <https://orcid.org/0000-0003-2146-6056>.

¹ Robert KILWARDBY, *De ortu scientiarum*, ed. Albert G. Judy (Toronto: University of Toronto, 1976), 160.

² “Our concept and Definition of Critical Thinking,” The Foundation for Critical Thinking, accessed 18 December 2020, <http://www.criticalthinking.org/pages/our-concept-and-definition-of-critical-thinking/411>. See also Richard W. PAUL and Linda ELDER, *The Miniature Guide to Critical Thinking: Concepts and Tools*, 4th ed. (Dillon Beach, CA: Foundation for Critical Thinking, 2006), 4.

INTRODUCTION

This paper aims at addressing, on the very long term, the social, anthropological and educational dimensions of logic. The approach is broader than the current one in history and sociology of philosophical knowledge, where the notion of discipline and the modern period have been mainly on the focus.³ We are interested in a variety of social uses of logic in the course of history, where the academic life of disciplines constitutes only a part of the whole picture.⁴

The period we begin with, the Latin 13th century,⁵ witnessed a series of major cultural changes: the birth of universities and centers of higher religious studies, where students numbered in the thousands, the rigorous construction of corpus and disciplines, the promotion of the education of the clergy, the emergence of new practices in pastoral care, and, eventually, the unprecedented development of civil and religious administrations. Logic which was already a key discipline among the arts of *trivium*, strongly associated with theology in the schools from the North of Europe during the 12th

³ See Volker PECKHAUS, “Language and Logic in German Post-Hegelian Philosophy,” *The Baltic International Yearbook of Cognition, Logic and Communication*, 4 (August 2009): 1–17, on the “logical question” in Germany during the 19th century, and Volker PECKHAUS, “Case Studies Towards the Establishment of a Social History of Logic,” *History and Philosophy of Logic* 7, issue 2 (1986): 185–186, for a program in social history of logic, but interested only in the genesis of modern logic. See Martin KUSH, *The Sociology of Philosophical knowledge* (Dordrecht: Springer, 2000), for some contributions in the sociology of logic, also focused on the modern period and on the sole history of disciplines.

⁴ See Julie BRUMBERG-CHAUMONT and Claude ROSENAL, “Introduction,” in *Logical Skills. Social-Historical Perspectives*, ed. Julie Brumberg-Chaumont and Claude Rosental, Logica Universalis (Basel: Springer, 2021), 1–22.

⁵ Many aspects of the history of the social and intellectual uses of logic in the Latin Middle Ages could be discussed, *mutatis mutandis*, for other cultural and religious eras in which Aristotelian logical cultures were strong and where the use of logic in the basic training of elites, especially religious ones, was also current; one can think in particular of the Jewish communities of Southern Europe, of the Byzantine schools, and, above all, of the religious and intellectual education in the Muslim world, where logic represented a fundamental science in the teaching of the madrasas, among the “rational sciences,” and where an intense reflection on the epistemology of knowledge and education developed, with a major role given to logic. We shall see further in this paper how an important part of the philosophy of logic developed by the great masters of the 13th century Latin universities, in particular by Albert the Great, was inspired by innovations introduced by Arabic philosophers (Alfarabi, Avicenna, Alghazali and Averroes) in this field, where they met a Latin 12th century tradition of valorizing methodical knowledge and practices. For a panorama of the varieties of logical education derived from the Aristotelian traditions, see Julie BRUMBERG-CHAUMONT (ed.), *L’Europe de la Logique. Les traditions aristotéliennes médiévales et modernes en contextes*. Studia Aristarum (Paris: Brepols, forthcoming).

century, played a major role in these changes. It constituted a propaedeutic discipline for almost any form of higher education, outweighing grammar and sweeping away rhetoric; it represented a unitary knowledge, based upon a unified Aristotelian corpus and an undisputed Aristotelian doctrine; it was a fundamental modality of discourse in the various disciplines, where texts and argumentative practices actually followed a pre-established, fixed syllogistic form; it offered a dialogical art of “disputation” (*disputatio*), which represented both a method in the establishment of truth and a compulsory performance for gaining university degrees, socially organized and controlled by teaching institutions.

Logic was also newly regarded as a rational science, an art of thinking, and a technique for perfecting the intellect of men. It was conceived of for the first time as a natural disposition, unique and universal, a “natural logic” whose structure was homogeneous to its artificialization in the science of logic taught in schools, the “artificial logic”; it allowed access to a full form of rationality, and, therefore, a full form of humanity. These new approaches to logic gave it an unprecedented anthropological foundation, while it relegated whole social groups, thought of as deprived of logic, to inferior forms of humanity or to the borders of humanity: children, women, ‘slaves,’ ‘barbarians,’ lay and illiterate people, peasants, ‘beasts,’ and other ‘pygmies.’

All these features also applied outside logic classes, including prestigious disciplines, such as theology, and beyond academic contexts, with the spread of the medieval culture of disputation, and the syllogistic formulation of ‘literary’ works. Medieval logic governed a logicalized university knowledge and constituted, more generally, a dominant argumentative culture.⁶

The medieval theories and practices of logic just described are today outdated. Its various elements formed a coherent whole which history has gradually disarticulated and erased, to a very large extent. Only the normative dimension of logic, but detached from its theoretical foundation and its educational value, seems to have retained some weight in our societies.

Our era is characterized by the disappearance of a formal teaching of logic in general education and by the end, in the modern period, of the practice of disputation as a fundamental intellectual form of scientific research and

⁶ See Julie BRUMBERG-CHAUMONT, *À l'école de la logique. L'essor d'une norme intellectuelle, sociale et anthropologique au XIIIe siècle*, Habilitation Thesis, École Pratique des Hautes Études, Paris, 2019; EADEM, “The Rise of Logical Skills and the 13th Century Origins of the Logical Man,” in *Logical Skills. Social-Historical Perspectives*, ed. Julie Brumberg-Chaumont and Claude Rosental, Logica Universalis (Basel: Springer, 2021), 91–120.

of gaining university degrees. The concept of intelligence has undergone major evolutions, by the integration of many sensory and cognitive elements prior to intellectual reflection, and by the affirmation, later on, in the opposite direction, of a computational approach to human thinking, with the emergence of the notion of Artificial Intelligence. Today, intellectual and scientific practices no longer follow a rigid and ritualized logical pattern.

The very notion of logic has also changed radically. Since the first decades of the 20th century, logic has been defined as a formal discipline, freed from the theorization of truth, knowledge, meaning, ideas, arguments, evidence, discovery and scientific method, which constituted the heart of its definition until then. This situation had led to a divorce between formal logic and the so-called ‘informal logic’ or the theory of argumentation, a notion utterly foreign to the Middle Ages. Moreover, the idea that the logic taught in schools would be “the” logic, has long since been challenged, with the humanist and modern criticisms of traditional logic, the advent of mathematical logic, and then, at the beginning of the twentieth century, the very end of the idea of logic as a unitary norm, with the emergence of an irreducible logical pluralism. The theoretical unity of logic broke up into a plurality of non-classical logics—intuitionistic, para-consistent, fuzzy, etc.—sometimes called ‘deviant’ logics, where the first logical principles that were thought to be intangible (identity, excluded middle, and even non-contradiction) were no longer accepted as self-evident..

As a consequence, social uses of logic today are essentially discriminatory. This can be observed either indirectly, in intelligence tests, or directly, in logical tests, according to a selection program largely based on the identification of ‘native’ logical skills of candidates in universities, administrations and companies, especially since the 1990s (‘logical reasoning tests’, ‘Thinking Skills Assessment,’ etc.).

However, some fundamental elements in our societies’ relationship to logic were built during the Middle Ages and can still be traced today. A remarkable and indelible medieval invention is the affirmation of the anthropological dimension of logic. Since Lucien Lévy-Bruhl’s introduced, at the beginning of the 20th century, the idea of the “pre-logical mentality,” this dimension has become perfectly explicit in the nascent modern anthropology and ethnology; it is still present in debates on the “logic of others,” especially in cognitive anthropology and intercultural philosophy, where denying logic to a given individual, culture or people, represents a taboo. The discriminatory use of logic, which comes along with its anthropological dimension, was in-

deed promoted in the Middle Ages, but with the major difference that this period placed logical skills at the heart of a project for the education of reason, and that the nature of discrimination was quite different, since there was no ‘selection’ at that time, either at school or at work. Eventually, some interesting parallels can be drawn between medieval conceptions of logic as a reflexive knowledge and a guide to reason, and the debates surrounding the educational value of critical thinking in the United States, and, more recently in Europe—a critical thinking that is no longer called ‘logic’, because of the appropriation of this term by formal logic since the first decades of the 20th century, and because of the much broader theories and practices targeted by the critical thinking movement.

This paper focuses on some of the major innovations observed in the situation of logic during the Middle Ages and tries to grasp them by investigating two newly emerged objects, and following their transformations in the modern period: the history of logical education and the historical anthropology of logic, with its correlative, the history of discriminations based upon logical abilities. As the approach is rather new and not yet fully familiar, even to historians of logic and medievalists, we offer at the beginning of each section a brief methodological and historiographical survey.⁷

1. SOCIAL USES OF LOGIC: A HISTORY OF LOGICAL EDUCATION⁸

LOGIC IN MEDIEVAL SOCIETY: A HISTORY OF LOGICAL EDUCATION

An approach to medieval logic in terms of a social history of logical education is by no means self-evident. Our own research in this field have been

⁷ The descriptive parts of this paper, devoted to the history of logic education and the anthropology of logic in the Middle Ages, are largely inspired by our recently published synthesis on the topic (BRUMBERG-CHAUMONT, “The Rise of Logical Skills”). They are based on the more in-depth study that is included in a forthcoming book (see BRUMBERG-CHAUMONT, *À l’école de la logique*).

⁸ For more details on the topic addressed in this section, and for bibliography, see BRUMBERG-CHAUMONT, *À l’école de la logique*; EADEM, “The Rise of Logical Skills,” and, for the Mendicant history of logic, BRUMBERG-CHAUMONT, Julie, “Les débuts de l’enseignement de la logique dans les *studia* dominicains et franciscains en Italie: une organisation précoce et innovante,” in *Les savoirs dans les ordres mendiants (XIII^e-XV^e s)*, ed. Joël Chandelier and Aurélien Robert (Roma: École Française de Rome Editions, forthcoming).

based upon a new proposal by John Marenbon in 2008.⁹ He emphasized how the introduction of logic as a core discipline in the education of intellectual elites was a medieval innovation, especially from the 12th century onwards, as opposed to the grammar-and-rhetoric-based education current in the Roman model, and as distinct from the special emphasis put on grammar in monastic schools during the High Middle Ages. John Marenbon called for the writing of a social history of logic, an approach he began to implement for the 11th and 12th centuries, and for which he has recently offered a vigorous defense.¹⁰ Our own work on the social history of logic extended this project to the 13th century, when the social weight of logic took on unprecedented dimensions, both quantitatively and qualitatively, in the context of the birth of universities. It led to an extension of the inquiry, as well as a complexification of the model. This was done by spatializing the inquiry, with a Southern Europe quite insensitive to the educational benefits of logic until the end of the 13th century, and a Northern Europe under Parisian influence. A variety of actors was also taken into account, especially the Mendicant Orders (mainly the Franciscans and Dominicans in the 13th century). It required conducting researches on logic as implemented in non-logical disciplines, putting the stress on logic practices, observing uses and values bestowed on logic, and, finally, identifying the birth of theories that emphasized the anthropological dimension of logic. The various aspects of logic as a norm in the world of medieval intellectual elites could thus be highlighted.¹¹

A fully historicizing approach to the notion of logic makes it possible to work on the basis of a broad definition of logic as a theory and practice of argumentation, of which only a very small part is represented by the theory of formal validity, corresponding to what has been called “logic” for only a century. On this broad historical basis, it is possible to take into account fields of inquiry which are not today labelled as “logic,” such as critical thinking or intelligence testing, and to find the opportunity of a dialogue between the social uses of logic during the Middle Ages and during the modern period.

⁹ See John MARENBNON, “The Latin Tradition of Logic to 1100,” in *Handbook of the History of Logic*, volume II: *Mediaeval and Renaissance Logic*, ed. Dov M. Gabbay and John Woods (Amsterdam: North Holland, 2008), 1–63.

¹⁰ See John Marenbon, “Pour une histoire sociale de la logique au haut Moyen Âge,” paper given at the symposium “L’Europe de la logique,” org. Alain de Libera, Antonella Romano, and Julie Brumberg-Chaumont, Collège de France, Paris, May 2018, https://www.academia.edu/38904388/Pour_une_histoire_sociale_de_la_logique_au_haut_moyen_%C3%A2ge.

¹¹ See BRUMBERG-CHAUMONT, *À l’école de la logique*; EADEM, “The Rise of Logical Skills.”

LOGIC AS THE “DISCIPLINE OF DISCIPLINES,” THE “ART OF ARTS,”
AND THE “SCIENCE OF SCIENCES”

In medieval philosophy of logic, logic was considered both 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 cognitive disposition of the agent 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, “of the proposition *as a conclusion of a demonstration*.”

The science of logic was not, however, a habitus like any other one, since the possession of this habitus was considered to be the driving force behind the acquisition of all other scientific habitus. Because of its ruling function with regard to other fields of knowledge, logic was described as a method of knowledge for all sciences, including itself, i.e. as its own underlying logic. It was generally described, from the 13th century onwards, as the “discipline of the disciplines,” according to a formula taken from Augustine, but also as the “art of the arts” (also sometimes ascribed to Augustine), and the “science of the sciences.”

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 artificial logic, which was 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 his very influential texts on logic, which compared those deprived of logical education to profane, illiterate people (*idiotae*) and even to natural agents (fire). As a consequence, logic as a method self-evident in other sciences (*logica utens*) did not consist in following a logical procedure spontaneously or thoughtlessly, but implied a conscious application of a logical knowledge that had been previously acquired thanks to the discipline of logic (*logica docens*). Artificial logic was conceived as the necessary enhancement of natural logic, which was judged fundamentally insufficient in order to provide a stable, certain form of knowledge, that is, by medieval standards, a ‘methodologized’ knowledge. Scientific knowledge required 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*:

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 who 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 proved **or disproven** (*probandum vel improbandum*); [...] 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 profane** (*idiotia*) **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** [= **the finality of man as an intellectual creature**] [...] This science is thus to be desired above all things.¹²

The scholarly medieval practice of truth was based on an art of disputation that guaranteed the contradictory, formalized, collective and socialized establishment of truth in a series of ritualized academic acts. Logic received an unprecedented social significance for the training of intellectual elites, for the fulfilment of their functions, as well as for their self-representations. Logic was a social code and a general method of teaching that largely monopolized scholarly spaces. It constituted the general knowledge of what knowledge is. It was based upon the education of the reflexive capacities of human reason, which are natural but need artificial enhancement. It thereby

¹² ALBERT THE GREAT, *De Quinque predicabilibus*, 31–6, 26 (Alberti Magni Opera Omnia 1,1, ed. Manuel Santos Noya, Cologne: Ascherdorff, 2004), 5.

represented a unique recursive knowledge in the realm of medieval sciences. As a consequence, it was also labelled a “general science” (together with metaphysics), as distinct from “particular sciences”.

A WORLD OF (LOGICALLY) REGULATED PRACTICES

The value bestowed on logic was part of a broader cultural context, where artificially-enhanced skills and guided practices represented a rising value in the medieval world of technical and intellectual practices, with a multiplication of practical and theoretical guides, the arts (*artes*), from the 12th century on. 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 dictaminis*).

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*), left to chance (*casu*), was proposed as early as the 12th century, within a context of strong artisanal, urban, intellectual and educational development¹³. The trend became dominant during the 13th century, with the birth of universities, the renewal of pastoral care and the development of civil and religious administrations. A logical modality was introduced in the exegesis of canonical texts and in the disputation (*lectio* and *disputatio*) which were, together with preaching (*praedicatio*), the most important discursive practices in the scholarly worlds. The philosophy of logic inherited from Arabic philosophers, some of them, such as Alfarabi, already strongly influential during the 12th century, gave a new theoretical dimension to this cultural trend, by describing logic as a rational science, by introducing the distinction between natural and artificial logic, and by promoting logic as the first grade of an intellectual perfection, as can be seen in the previously-quoted text by Albert the Great.

¹³ See Richard William HUNT, “The Introductions to the Artes in the Twelfth Century,” in *The History of Grammar in the Middle Ages. Collected Papers*, ed. Geoffrey L. Bursill-Hall (Amsterdam: John Benjamins Publishing, 1980), 117–144.

A 'PARISIAN LOGICAL MODEL' OF EDUCATION: BIRTH AND DIFFUSION
IN NORTHERN AND SOUTHERN UNIVERSITIES AND IN THE SCHOOLS
OF MENDICANT ORDERS

Among the newly born universities at the beginning of the 13th century, the most important were those of Paris, Oxford, Bologna, and Montpellier, where thousands of students converged. Logic received a predominant place in the University of Paris, where a 'Parisian logical model' of education was designed, a model adopted by other universities based upon the Parisian model in Northern Europe, as in Oxford. Following a diversity of patterns, some of the Southern universities were partially influenced by the Parisian model; logical education also gradually became more widespread in disciplines such as law, and in areas, such as Southern Europe, where it was not originally important in the traditional education of the elite, rather based on grammar and rhetoric, in accordance with the Roman model. This was especially the case in Toulouse, and in North Italy, at Bologna, and then at Padua, where the teaching of logic took place in the Faculty of Medicine (there being no Faculty of Arts), and became important only by the end of the 13th century.

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 thousands individuals at the end of the 13th century, belonged to the Faculty of Arts. They were adolescents or very young men, between thirteen and twenty-one years of age, supervised by more than a hundred masters who were themselves very young. Many of the North-European students converged in the yet-unrivalled University of Paris. Without being statutorily required, previous studies in the Faculty of Arts were standard among students of the higher faculties, especially in theology. The best part of the teaching organized at the Faculty of Arts was dedicated to logical learning. This applies to the program in arts in Paris as a whole during the early 13th century, and then to the undergraduate program, the BA, for the rest of the Middle Ages.

Logic as taught in the Faculty of Arts corresponds to a level of education that can be called "higher education," since it belongs to university training, as opposed to primary teaching concerned with literacy and numeracy, and as distinguished from a "secondary," pre-university level of education. It was nonetheless located at a propaedeutic level, in contrast with the "higher" faculties of the universities, namely the faculties of law, medicine and theology. However, the university teaching of logic at the Faculty of Arts repre-

sented only a part of medieval logical education. Before it, 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, equivalent to a secondary level today. After it, 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, as well as a strong reception of Aristotelian logic in the Faculties of Medicine.

Mendicant schools of logic represent the second major aspect of the history of logical education. The most important Mendicant Order systems of education during the 13th century were those developed by Dominicans and Franciscans. The middle of the 13th century witnessed the creation of a network of specialized schools of logic, organized at a provincial level, in all provinces. Those schools were called *studia artium*, that is to say, “schools of arts.” The very choice of this name for schools dedicated solely to logic indicates how much Mendicant Orders depended on a Parisian logical model of education. However, they adapted it in a significant manner, and considerably contribute to its diffusion in the South of Europe, which was still a “logical desert” at the middle of the 13th century.

Schools of logic were for long the only schools where secular sciences were taught, in addition to theology. The first schools of logic were implanted in the South of Europe and were prescribed, for each province, at the level of the General Chapter of the Dominican Order as early as 1259. They were generalized across all the other provinces from the 1270s. From two to three years of studies were dedicated solely to Aristotle’s logic. In contrast, the schools dedicated to philosophy had a different name, “schools of philosophy” (*studia philosophiae*) or “schools of natural realities” (*studia naturalium*), and they were generalized several decades after those of logic.

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. Contrary to schools of philosophy, schools of logic were attended by a significant portion of the “ordinary friars,” trained only for performing their pastoral duties (preaching, confessing). This recruitment enlightens yet another aspect of the social value bestowed on logic, although the direct usefulness of logic for confessing and preaching practices cannot be straightforwardly established.

The teaching of logic was implemented, in addition to this specialized level, at all levels of mendicant education: before it, with an introduction

to elementary logic in conventual schools or in lower-level provincial schools, and after it, 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 texts from the 13th century, read throughout the Middle Ages and still during the Renaissance, were produced in this context of a theological teaching of logic, written by Albert the Great, Thomas Aquinas, Giles of Rome, John Duns Scotus, and, for the 14th century, by William of Ockham, with his famous *Sum of Logic* (ca. 1323/1325).

THE LOGICALIZATION OF PRACTICES OF KNOWLEDGE, TEACHING,
AND GRADUATING AND THE RISE OF ‘LOGICIAN’ PRACTICES

The studies conducted by Olga Weijers have fully illustrated the crucial role devoted to disputations in university intellectual work.¹⁴ Conducting and organizing disputations were compulsory in order for masters to perform their teaching duties and for examination, with the BA disputations called “determinations”. This was the case in the Faculty of Arts, where disputations were based on logical “puzzles” (*sophismata*), as well as in other faculties, in law, medicine and theology, included Southern universities, such as Bologna, specialized in law, or Montpellier, specialized in medicine, where disputations were also the basis of everyday life at university. Disputations were also a major aspect of teaching in the Mendicant system of education.

The logicalization of practices of knowledge and teaching was reinforced by the advent, by the middle of the 13th century, of a new type of formalized disputation, the “syllogistic disputation,” where a rigid five-points form (question, argument for, arguments against, solution, response to the arguments) was followed. It was described by its medieval practitioners as a “super-syllogism’ or a “syllogistic act”. This formal disputation became the preferred

¹⁴ For intellectual and graduating practices see Olga WEIJERS, “Les règles d’examen dans les universités médiévales,” in *Philosophy and Learning. Universities in the Middle Ages*, ed. Maarten J.F.M. Hoenen, Jakob Hans Josef Schneider, and Georg Wieland (Leiden/New-York/Cologne: Brill, 1995), 201–223; for the Faculty of Arts in Paris, see EADEM, *La ‘disputatio’ à la Faculté des arts de Paris (1200-1350 environ). Esquisse d’une typologie* (Turnhout: Brepols, 1995), for faculties of arts elsewhere see EADEM, *La ‘disputatio’ dans les Facultés des arts au Moyen Âge* (Turnhout: Brepols, 2002). For disputations in the other faculties, see EADEM, *Queritur Utrum. Recherches sur la ‘disputatio’ dans les universités médiévales* (Turnhout: Brepols, 2009), and, for a recent overview, see EADEM, *In the Search of Truth: A History of Disputation Techniques from Antiquity to Early Modern Times* (Turnhout: Brepols, 2013).

mode of exposition in all disciplines, a scientific literary genre, and a standard textual unit in other types of productions. This is the case with Thomas Aquinas' *Sum of Theology*, to take a famous example: the *Sum* is just a huge combination of disputed questions following a syllogistic form of disputation.

The same period also witnessed a new logical practice, namely the systematic reconstructions of the syllogistic structures in Aristotle's work, a 'syllogization' which also concerned, to a lesser extent, other canonical texts on which university teaching was based, such as the Bible. When applied to logical texts, this method means that Aristotle's logic was itself logically, recursively reconstructed.

Logic thus offered a codification governing discursive practices by making available a palette of forms to which it was necessary to conform, while the logical forms themselves were perceived as syllogistic in their essence (whether they actually looked so or not). These practices were what we call 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, often in a meta-logical way, i.e. through meta-logical terms. Those included topical and syllogistic concepts, such as "premise," "conclusion," "consequence," "syllogism," "principle," "proof," "fallacy," etc., but also meta-logical terms that belonged to disputation, such as "argument for," "argument against," "solution," "opponent," "respondent," etc., all terms that began to appear as "stage directions" in disputational texts during the 13th century.

Logical practices were reflexively thought of and logically performed by the actors themselves, and not "essentially implicit and often unconscious," as contended by Olga Weijers, who offers a comparison with today unconscious use of argumentative rules.¹⁵ The disappearance of formal logical education 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. On the contrary, the normativity of logic was reinforced by the fact that the intellectual productions logic was supposed to govern were originally designed by way of following a logical form, socially controlled as such. Logic presided over the formalization of the intellectual and scholastic practices, and was projected onto the very structure of the canonical texts that were the basis of medieval culture.

¹⁵ See Olga WEIJERS, "Between Logic and Law: the *loci logicales* of the jurists," in EADEM, *Études sur la Faculté des arts dans les universités médiévales, recueil d'articles* (Turnhout: Brepols, 2011), 411.

Today, logic no longer belongs to basic education and to core disciplines, as was the case during the Middle Ages, but also, to a lesser degree, in the early-modern period, in secondary schools (“college,” “gymnasium”), with some extensions into modern times. The disappearance of logic from the A-level program (Baccalaureate) in France, for instance, dates back to 1960.¹⁶ Traditional logic, largely inherited from scholastic logic, kept being taught in logic courses at the beginning of the 20th century, while it still formed the basis of logical training for the Catholic clergy — just as medieval logic inherited from Avicenna (11th century) and, more remotely, from Aristotle’s logic, was taught in the madrassas of the Muslim world, and was part, for instance, of the long-lived “Nizami curriculum” in India.¹⁷ It can be said that the logical Middle Ages definitively ceased to exist by the middle of the 20th century. A new form of scholasticism took over the philosophical worlds, often quite comparable to that of the Middle Ages, with its focus on the contradictory resolution of chains of scholarly disputes — but that is another story.

MEDIEVAL AND CONTEMPORARY THEORIES AND PRACTICES OF LOGICAL EDUCATION: MEDIEVAL LOGIC AND MODERN CRITICAL THINKING

The educational value bestowed on logic has resurfaced in recent decades, through the introduction in the United States and Europe¹⁸ of a disciplinary and cross-disciplinary teaching of ‘critical thinking’,¹⁹ ‘argumentation’ or even ‘rhetoric’ (in France), with a clear awareness of the political and anthropological expectations associated to it.

Critical thinking is both a theory and an educational movement,²⁰ as it is intimately connected to educational policies. This is true of the first formu-

¹⁶ See Bruno POUCKET, *Enseigner la philosophie, histoire d’une discipline scolaire (1860-1990)* (Paris: CNRS Éditions, 1999).

¹⁷ See Asad Q. AHMED, “Dars-I Nizami,” in *Encyclopaedia of Islam* III, ed. Kate Fleet, Gudrun Krämer, Denis Matringe, John Nawas, and Everett Rowson, consulted online July 2019, http://dx.doi.org/10.1163/1573-3912_ei3_COM_27350. See also IDEM, “Logic in the Khayrābādī School of India: A Preliminary Exploration.” In *Law and Tradition in Classical Islamic Thought*, edited by Michael Cook, Najam Haider, Intisar Rabb, and Asma Sayeed (New York: Palgrave Macmillan, 2013), 227–243, for the teaching of logic in earlier periods in India.

¹⁸ The movement is well-known in the USA. For recent endeavor in Europe see, for instance, “Critical Thinking Across the European Higher Education Curricula Project,” support by the Erasmus+ program (<http://crithinkedu.utad.pt/>).

¹⁹ For a general presentation of the definition of critical thinking see David HITCHCOCK, “Critical Thinking (2018 version).” *Stanford Encyclopaedia of Philosophy*, Fall 2020 Edition, ed. Edward N. Zalta. <https://plato.stanford.edu/archives/fall2020/entries/critical-thinking/>.

²⁰ For a recent synthesis of major different approaches to critical thinking, including Dewey, Paul, and Ennis, see David HITCHCOCK, “Seven Philosophical Conceptions of Critical Thinking:

lations by John Dewey, at the beginning of the 20th century, within the framework of practices set up in his own school, as well as of present day's reflections. Critical thinking is first and foremost an element of educational policies in high schools and undergraduate programs in universities, with dedicated courses, institutes, official brochures designed by educational institutions, and even online course platforms. Although critical thinking skills are included in numerous tests,²¹ and the critical thinking movement has developed its own batteries of tests, the approach is essentially guided by a search for educational progress, not for selection on the basis of rational aptitudes that would be have been already acquired and considered (allegedly) spontaneous. We thus focus here on the educational dimension of the movement, in order to reflect on possible parallels with the role played by logic in medieval intellectual life and education. This idea has been already proposed by Olga Weijers who brought together the medieval art of disputation and critical thinking.²² When the method followed in history of logic is based on the study of logical practices as guided by intellectual ideals, social values and anthropological representations, these parallels are indeed much more historically significant than those one could try to draw between medieval logic and formal logic today. The teaching and researches conducted on the later represents an infinitesimal fraction of today social uses of logic, as well as an extremely restrictive notion of logic, if compared to what has been called "logic" for more than two millennia.

As seen, the philosophy of logic developed by medieval thinkers included, in addition to logical theory, a theory of logical practices. It offered a model for a contradictory, dialogical and collective search for truth, in contrast with the modern, romantic idea of genius, a model which can fruitfully enter in dialogue with contemporary sociology of scientific communities. It also contained an epistemology of education, where an in-depth reflection on the general method of knowledge acquisition was formulated. This was characterized by a principled rejection of autodidacticism, on one hand, but also, on the other hand, by teaching practices focused on the logical appropriation of disciplinary contents by those we now call "learners". There

Themes, Variations, Implications," in *Critical Thinking and Reasoning: Theories, Development, Instructions and Assessment*, ed. Daniel Fasko, Jr., and Frank Fair (Leiden/Boston: Brill, 2020), 9–30.

²¹ The Oxford TSA tests a series of skills, some of them belonging to critical thinking, as can be seen on the dedicated page of the university website: "Problem-solving skills, including numerical reasoning. Critical thinking skills, including understanding argument and reasoning using everyday language."

²² See Olga WEIJERS, *In the Search of Truth: A History of Disputation Techniques from Antiquity to Early Modern Times* (Turnhout: Brepols, 2013), 300–301.

also was a transdisciplinary as well as a disciplinary approach to logical education. All these issues may find echoes in the intense reflections and large-scale projects nowadays focused on education to critical thinking, where the issue is still to learn how to think well, that is, at least partially, to think in a logical way.

Some parallel formulations could include an insistence on the social, political and anthropological value bestowed on critical thinking; the description and justification of the organization of an undergraduate, transdisciplinary teaching of critical thinking, generally carried out by philosophy professors, for all departments of the university; the alternative development of an embedded teaching of critical thinking in each of department; a desire to develop “generic and transferable skills” in all areas of university knowledge, or, again, the existence of a teaching of critical thinking both at pre-university and at university level. These elements are recurrent, as can be seen, for instance, in some recent publications by a leading figure of the critical thinking movement, Robert Ennis.²³ One can also think of the ethical dimension of logic, as a self-fashioning and self-management of one’s thought, a dimension on which Richard Paul has much insisted.²⁴ We can also mention the description of critical thinking as the research for an optimal participation in a community of enquiry. By insisting on the collective, rational, dialogical, contradictory and socially regulated construction of knowledge, this approach opens parallels with the medieval practice of disputation, where truth was equated to the dispel of doubt, and intellectual research was based on the non-relativistic horizon of an always-possible revision.

The differences are also great. We can mention especially the doubts generally raised today about the usefulness, and even the relevance, of formal logic for the art of reasoning (even if not every one agrees²⁵); the absence of a single argumentative logical norm, rigidly applied to the practice of argumentation, where obedience to rules, rather than autonomous thinking, would be the main logical virtue, as was the case during the Middle Ages; the essentially pragmatic, ethical, political, professional and social value envisaged for reasoning in critical thinking education, where scientific research is

²³ See Robert H. ENNIS, “Critical Thinking Across the Curriculum,” in *Virtues of Argumentation. Proceedings of the 10th International Conference of the Ontario Society for the Study of Argumentation (OSSA), 22-26 May 2013*, ed. Dima Mohammed and Marcin Lewiński (Windsor: Ontario Society for the Study of Argumentation (OSSA), 2013), 1–16.

²⁴ See PAUL and ELDER, *The Miniature Guide to Critical Thinking*.

²⁵ See, for instance, David SHERRY, “Formal Logic for Informal Logic,” *Informal Logic* 26, issue 2 (2008): 199–220.

not particularly targeted²⁶; the valuation of the affective dimension of argumentative exchanges, quite alien to medieval logic, only to mention some obvious examples. These limitations could be partially challenged, however, as future researches on medieval logic would be better connected to investigations carried out in social epistemology or sociology of logic, especially when interested in justified beliefs and demonstrations,²⁷ or when it would invest currently neglected topics, such as the logic of prudence, the typical political virtue in the Aristotelian tradition (which would be close enough to critical thinking) and of pragmatic reasoning, where a logic of ethics and a prudential practice of logic could be enlightened.

2. SOCIAL USES OF LOGIC: HISTORICAL ANTHROPOLOGY OF LOGIC AND DISCRIMINATION²⁸

Once the principle of a generalized logical education was established, a discriminatory use of logic emerged in the course of history, which survived the extinction of the teaching of logic as a core discipline.

A HISTORICAL ANTHROPOLOGY OF LOGIC: PAST AND PRESENT

The idea of investigating the anthropological dimension of logic was triggered, on the one hand, by recurrent questions about the limits of humanity and about the contribution of logic to the ‘humanization’ of man in medieval texts, and, on the other hand, by the existence of a logical formulations in the reflections of classical anthropology and ethnology on mentality and knowledge, when these disciplines emerged at the beginning of the 20th century. As already mentioned, this was first observed in Lucien Lévy-Bruhl’s famous notion of a “pre-logical mentality.”²⁹ It developed, in a much more

²⁶ For the characterization of the mode of reasoning at Rome as critical thinking, see Claudia MOATTI, *The Birth of Critical Thinking in Republican Rome*, transl. Janet Lloyd (Cambridge: Cambridge University Press, 2015).

²⁷ For a sociology of demonstration where virtually every kind of social practices of demonstrations is taken into account, see Claude ROSENAL, *La Société de démonstration* (Paris: Éditions du Croquant, 2019).

²⁸ For more details on the topic addressed in this section, and for bibliography, see BRUMBERG-CHAUMONT, *À l’école de la logique*, chapter 6, and EADEM, “The Rise of Logical Skills.”

²⁹ See Lucien LÉVY-BRUHL, *Les fonctions mentales dans les sociétés inférieures* (Paris: Hachette, 1910).

articulated way from a theoretical point of view, in debates generated, at the middle of the 20th century, among logicians, philosophers, sociologists and anthropologists, by the question of the so-called ‘logic of the Azande,’ which Evans-Pritchard would have described in his book on witchcraft, debates which intersected with the problem of logical pluralism, also appeared at the same period.³⁰

Here again, the idea that logic could be part of the making of humanity and ascribed a normative value in the definition of man was first formulated in the Middle Ages. It is no coincidence that this was the very period when logic substituted for rhetoric and grammar, the two disciplines which dominated in the Hellenistic and Roman models of education, and which were ascribed an anthropological dimension in ancient periods.³¹

First developed within Arabic philosophy of logic during the 10th, 11th and 12th centuries, in contexts where teaching was not institutionalized as it was in European schools and universities, the theorizing of the anthropological dimension of logic took on a new impetus when it was received in the Latin world. It resonated with rising values in Latin cultural history, such as the *reductio ad artem* of a large number of practical and theoretical skills, and took on an utterly new social dimension, with the establishment of logic as a core discipline in nascent universities, where access to higher education now concerned thousands of often-unprepared very young (14 to 21 years old) students every year.

The rise of logic as an educational and social norm went thus hand in hand with the emergence of a new insistence on the anthropological dimension of logic amongst an elite of professional philosophers and theologians. Far from providing a simple “training” in an ordinary, modern sense of the term, the acquisition of logical science was thought of as a self-fashioning,

³⁰ See Julie BRUMBERG-CHAUMONT, “À l’Est (et au Far-Ouest) de la logique, rien de nouveau,” in *The Territories of Philosophy in Modern Historiography*, ed. Catherine König-Pralong, Mario Meliadó, and Zornitsa Radeva (Bari/Turnhout: Brepols, 2019), 49-62, and Claude ROSENAL, “Referring to Logical Skills to Assess the Rationality of an Ethnic Group: The Zande Case in the History of the Social Sciences,” in *Logical Skills. Social-Historical Perspectives*, ed. Julie Brumberg-Chaumont and Claude Rosental. *Logica Universalis* (Basel: Springer, 2021), 63–74.

³¹ See Philippe HOFFMANN, “Du danger de ne point parler. Un argument d’Elias,” in *Affamés volontaires. Les monothéismes et le jeûne: austérités religieuses et privations alimentaires dans une perspective comparative*, ed. Sylvio Hermann de Franceschi, Daniel-Odon Hurel, and Brigitte Tambrun-Krasker (Limoges: Presses Universitaires de Limoges et du Limousin, 2020), 207–237, and Catherine ATHERTON, “Children Animals, Slaves and Grammar,” in *Pedagogy and Power, Rhetorics of Classical Learning*, ed. Yun Lee Too and Niall Livingston (Cambridge: Cambridge University Press, 1998), 214–244.

humanizing activity. Many of the most influential thinkers of the time enjoyed intellectualist views; they defined man by his intellect and mental life by its intellectual operation, with a clear differentiation, in man, between the inferior (sensitive) and superior (logical-intellectual) cognitive faculties. They also agreed on a conception of rational abilities as essentially logical in nature and as educable by logic, defined as an art (a technique) and a science. The Aristotelian definition of the rational soul as the substantial form of man, soon widely adopted during the 13th century, the intellectualism that prevailed in scholarly anthropology, coupled with a methodological definition of knowledge, hostile to any form of autodidacticism, gave logic a completely new anthropological, in addition to epistemological, foundation.

This theory was based upon a Christian-Aristotelian doctrine of the rational soul, which made reason something that is possessed, by divine infusion, but made rational thought something that is acquired by being exercised, that is to say: by being logically exercised. 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. Within this framework, logic, 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 one can actualize only by performing intellectual operations. A philosophical tradition that valued “logical perfection” thus resonated with the Christian idea of “logical reparation” of the soul. This theory presented, according to a model established in the 12th-century, the acquisition of the liberal arts as a reparation for the deficiencies caused in the soul by Original Sin.

As a consequence, the divisions of “artificial logic” were for the first time projected onto the natural functioning of the human mind, the “natural logic”. The discipline of logic was 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 were 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* artificially enhanced and regulated the first operation, the *Peri hermeneias* the second one, 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 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 its necessary technical improvement through the acquisition of artificial logic, were rejected to the margins of humanity, as “logically disabled” creatures.

A MEDIEVAL LOGICAL (AND SUB-LOGICAL) SCALE OF HUMANITY

The various works by Albert the Great, one of the greatest and more influential theologian and philosopher from the 13th century, delineate ‘logical scale of humanity.’ His philosophy of mind, knowledge and logic suggests a hierarchy, from divinized philosophers (necessarily experts in logic) to intellectually deficient people (*moriones*), with infants as a model of absolute ignorance (*nescientia*), for lack of a yet-developed natural logic. Uneducated people (*idiota*) or “bestial” men (*bestiae*) are almost put on the same level as intellectually deficient people (*moriones*), for lack of an artificial logic that would actualize their partially deficient natural logic. *Idiotae* and bestial men cannot go beyond sensitive cognition, while *moriones* are just enable to encode sensitive information. Just above, one finds the bad-witted (*malum ingenium*) people, who cannot have access to intellectual cognition and formal education, but can be guided on the basis of imaginary knowledge. Below the perfect philosopher, one finds the gifted student, on his way to perfection³². The absolute “logically disabled” people,” the *moriones* (together with melancholic people and people with head injuries) corresponds, in theology, to the “invincibly ignorant” creatures.³³ At the bottom of the hierarchy, one can eventually find “naturally intellectually deficient creatures” (*naturaliter moriones*), the “pygmies”. In his zoological tract, the *De animalibus*, Albert described pygmies as “super apes,” which are nevertheless decidedly not human because of the absence of a natural logic. Their “shadowy reason” doesn’t 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. This is because they do not perform the first operation of natural logic, the

³² See especially ALBERT THE GREAT, *De intellectu et intelligibilis* (Opera Omnia IX, ed. Auguste Borgnet, Paris: Vives, 1890), 501b–502a.

³³ See ALBERT THE GREAT, *Summa theologiae* (Opera omnia XXXIII, ed. Auguste Borgnet, Paris: Vives, 1895), 160B, and ALBERT THE GREAT, *De Sophisticis elenchis* (Opera omnia II, ed. Auguste Borgnet, Paris: Vives, 1890), 373A-B.

abstraction of universal concepts, which is the basis of a subsequent logical development:

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 of 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**

[...]

[The pygmy] **uses neither rhetorical nor even poetical arguments by way of persuasion, which are the most imperfect arguments of all**³⁴.

The overvaluing of logical abilities and of logical education gained by formal training has thus its counterpart in the stigmatization of “logically disabled” people, endowed with a faltering humanity. A text written by a Master of Arts in Paris from the end of the 13th goes as far as calling people deprived of logical education “useless beats, called ‘men’ in a homonymous way”:

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 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 ordained 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*).**

³⁴ See ALBERT THE GREAT, *De animalibus* (ed. Hermann Stadler, Münster: Aschendorff, 1916–1920), 1323 and 1328.

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 profane (*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.³⁵

INTELLIGENCE TESTING

The issue of intellectual deficiency is now partially addressed through intelligence testing, which we distinguish here from logical tests, discussed a bit further.

Intelligence tests, and later IQ tests³⁶, are not strictly speaking tests of logic, at least if 'logic' is understood, as it is here, as the correct formulation of a reasoning (without necessarily being meta-logically designated as such). They can be more accurately described, in the perspective of the present dis-

³⁵ (PS?)-SIMON OF FAVERSHAM, commentary on Peter of Spain's *Tractatus*, ed. in Lambertus Marie DE RIJK, "On the Genuine Text of Peter of Spain's *Summule Logicales* II: Simon of Faversham (d.1306) as a Commentator of the Tracts I-V of the *Summule*," *Vivarium* VI/2 (1968): 77-78. For more details, see BRUMBERG-CHAUMONT, *À l'école de la logique*, chapter 6, and EADEM, "The Rise of Logical Skills."

³⁶ In the first version of the IQ, the actual age was first divided by the mental age (instead of being subtracted as in Binet) and then the actual performances were compared the normal one for a given age, normalized at 100, with a standard deviation of 15, as in modern IQ tests. For a recent synthesis see N.J. MACKINTOSH, "History of Theories and Measurement of Intelligence," in *The Cambridge Handbook of Intelligence*, ed. Robert J. Stenberg and Scott Barry Kaufman (Cambridge: Cambridge University Press, 2011), 3-19. For an in-depth study of psychometric tests at the beginning of the 20th century, see Olivier MARTIN, *La Mesure de l'esprit. Origines et développement de la psychométrie, 1900-1950* (Paris: L'Harmattan, 1997). For a critical discussion, with a sharp contrast between American 20th-century uses of intelligence testing and Binet's conception, see Stephen Jay GOULD, *The Mismeasure of Man*, revised edition (New York: W.W. Norton, 1996).

cussion, as tests of ante-logical intelligence, ultimately aimed at a set of intellectual operations that form the conditions for logical reasoning, especially abstraction and judgement. This situation can be explained in various ways. Generally speaking, the naturalist heritage predominant in the periods preceding the birth of intelligence tests offers a notion of ‘intelligence’ quite different from our spontaneous representation of it. Since the 18th century, and even more so during the 19th century, these conceptions, in the fields of biology, psychology and anthropology, made ‘intelligence’ a principle of organization and evolution of nature, of which the rational life of the human psyche, and the logic attached to it, was only the highest expression. These theories saw a continuum between men and other animals, attributed to animals an intelligence comparable, albeit inferior, to that of men, and opened the way for the classification of some men, judged racially inferior, because they belonged to ‘regressive’ or ‘retarded’ races, at the same level as some animals.³⁷ In American anthropology, at the same time, the evolutionary pattern common to all living things was even called “natural logic,” a notion still read in Jean Piaget’s theory of development.³⁸ In a closer intellectual context, the dominant psychological conceptions at the time when Alfred Binet and Théodore Simon invented their tests, were largely based upon the theory of association of ideas and on “elementarism” in the field of experimental psychology, under the influence of Wilhlem Wundt. The mental tests previously carried out by Francis Galton and James McKeen Cattel were thus essentially concerned with sensations, and not with higher processes, which Alfred Binet also took as the constituents (in addition to sensation and perception,³⁹ perceptual judgement, calculation, memory, imitation, attention, abstraction,⁴⁰ etc.) of an intelligence itself conceived of as a plural reality. Eventually, the immediate social purpose of the tests must be taken into account, i.e. the evaluation of ‘abnormal children’ for Albert Binet, and then of recruits, in the large-scale tests developed in the United States (army, ele-

³⁷ See Claude BLANCKAERT, “Natural Logic, Anthropological Antilogies, and Savage Thought in the 19th Century,” in *Logical Skills. Social-Historical Perspectives*, ed. Julie Brumberg-Chaumont and Claude Rosental. Logica Universalis (Basel: Springer, 2021), 51–62.

³⁸ See Scott PRATT, “Decolonizing ‘Natural Logic’,” in *Logical Skills. Social-Historical Perspectives*, ed. Julie Brumberg-Chaumont and Claude Rosental. Logica Universalis (Basel: Springer, 2021), 23–50.

³⁹ See Alfred BINET and Théodore SIMON, “Méthodes nouvelles pour le diagnostic du niveau intellectuel des anormaux.” *L’Année psychologique* 11 (1904), 1905: 196, where sensation and perception are said to be as much part of intelligence as “reasoning.”

⁴⁰ For the role of the function of abstraction, the “key” of intelligence, see Alfred BINET and Théodore SIMON, *Les Enfants anormaux* (Paris: L’Harmattan, 1907), 47–58.

mentary school population), which implied to target very elementary intellectual performances.

The ‘intelligence’ of intelligence tests was thus largely represented by linguistic, perceptual and cognitive skills which come prior to the formulation of explicit logical reasoning. Intelligence tests did not, and still do not in their current versions (e.g. in the 2003 Stanford-Binet test), include tests of explicit logical reasoning, or judgements about the correctness of a given reasoning. It can thus be said that, with intelligence tests, one is tested on a set of abilities whose culmination is limited, at most, to the formulation of abstract concepts and relationships, which could, at a later stage of complexification of tasks, be implemented in logical reasoning. Tests are aimed at skills whose deficiencies make it impossible to formulate logical reasoning. As a result, those whose performance on these tests is clearly inadequate (more than three years of retardation for children, less than 12 years of ‘mental age’ in the Binet scale for adults, less than 70 in today standardized IQ tests) will be unable to think logically.

The history of intelligence tests is thus connected to the classification of ‘mental retardation’. The categories used by alienist doctors at the time the tests were invented are verbally similar to the categories of ‘logically disabled’ people which appeared in the texts by Albert the Great mentioned in the previous paragraph: “idiots,” “morons,” and “feeble-minded.” These terms are nowadays discarded, although the generally rejected notions of ‘retardation’ or ‘mental age’ have not definitively disappeared from psychiatry textbooks. IQ tests are still instrumental, even though they are no longer used in the classification of the degrees of intellectual deficiency (for example in the DSM-5). The gap between the designated realities from one time to the other obviously remains wide, but connections cannot be excluded. This could be especially the case when we think of the hereditary and eugenicist motivations for the reintroduction of the term “moron” into psychology and psychometry, which we will discuss a bit further, or the explicit identification of Albert’s ‘pygmies’ with the apes imported into Europe by modern explorers, thereby contributing to the history of the ‘simianization’ of the ‘inferior races’⁴¹.

⁴¹ See Johannes M.M.H THUISSEN, “Reforging the Great Chain of Being: The Medieval Discussion of the Human Statues of ‘Pygmei’ and its Influence of Edward Tyson,” in *Ape Man, Apeman: Changing Views since 1600*, ed. Raymond Corbey and Bert Theunissen (Leiden: Department of Prehistory of Leiden University, 1995), 43–50, and IDEM “Between Apes and Angels: At the Borders of Human Nature.” In *Envisioning Nature, Science and Religion*, ed. James D. Proctor (Dordrecht/Heidelberg/New-York/London: Templeton Press, 2009), 83–103; for the history of simianization,

Intelligence tests have been designed by Alfred Binet and Théodore Simon in 1905 in order to deal with children who were “school abnormal,” unfit for standard schooling, which had become compulsory in France for some years. These were distinguished, above, from “normal children,” and, below, from children whose mental deficiencies were due to a pathology that needed to be treated clinically and who were “uneducable”. Among the alienist classifications of the time, abnormal children in school included the “feeble-minded individuals” (the “débiles” in French), and, at the margin, some more gifted “imbeciles” ; it excluded “idiots,” whose place was in the asylum. With the 1908 version of the intelligence tests, which allowed a ‘mental age’ to be calculated, these different categories corresponded to a mental age of less than two years (“idiots”), seven years (“imbeciles”) and 12 years (“débiles” = “feeble-minded”), in absolute value, for an adult (which was not of direct interest to Alfred Binet), and to a retardation of more than two years in mental age, for a child. But no absolute value was bestowed on these measures. There was no question of carrying out these tests on an entire segment of the population. The purpose of these tests was not to identify the intellectually deficient children: a “school abnormal” was initially a child who was three years behind at school⁴², and then, among the latter, a child whose ‘mental age’ was indeed two years or more below the norm.⁴³ Nor was it a question of judging the intelligence of these children, in the manner of subsequent testing practices. The purpose was to assess the difficulties of the children, in order to devise for them a separate, “special education,” which Alfred Binet had been commissioned to devise by French government. Intelligence was for Alfred Binet and Théodore Simon “natural,” but only as opposed to school instruction.⁴⁴

There may be echoes between the logical and sub-logical scale of humanity proposed by Albert the Great and the history of the use of tests for the stigmatization of the intellectually deficient, and racially-socially inferior individuals and groups, a history quite different from the original intentions of the inventors of intelligence tests. This American history was constructed in a hereditary, racist and hostile context for the intellectually deficient people, where the term “moron” reappeared in the pen of the American peda-

see Wulf D. HUND, Charles W. MILLS, and Silvia SEBASTIANI (eds), *Simianization. Apes, Gender, Class and Race* (Berlin/Münster/London/Wien/Zürich: LIT Verlag, 2016).

⁴² See BINET and SIMON, “Méthodes nouvelles,” and Alfred BINET and Théodore SIMON, “Le Développement de l’intelligence chez les enfants,” *L’Année psychologique* 14 (1907), 1908: 1–94.

⁴³ In the 1908 version of the tests, BINET and SIMON, “Le Développement,” 74.

⁴⁴ BINET and SIMON, “Méthodes nouvelles,” 196.

gogue Henri Goddard in 1912 to designate this intermediate class, the “feeble-minded,” equivalent to Binet’s “débile” in France, with “a ‘mental age’ ” under 12 years old. But the major difference was that “native” dispositions, inscribed in the heredity of genes, according to the new scientific paradigm, and even in race, were then targeted, not intellectual functions as being “educable.” Moreover, this category indiscriminately included adults and children, and eugenic projects were associated with it. Finally, psychometric practices were not based on any theoretical reflection on the notion of intelligence, unlike what can be read in Alfred Binet’s numerous philosophical and psychological works.

In 1917, the same Goddard subjected Ellis Iland’s immigrants to Binet’s tests, resulting in the classification of almost 80% of some European peoples (or “races” in the vocabulary of the time) as feeble-minded. With another American psychologist, Lewis M. Terman, the Binet test, extended to adults and standardized at 100 for a normal mental age, with a standard deviation of 15 points, as it is known today, gave rise to large-scale campaigns, in the army (*alpha* and *beta* tests, for the illiterate), then in primary schools. They aimed at eliminating, together with the intellectually deficient people, vice, crime and poverty, themselves explained, directly and indirectly, by intellectual deficiency. The rest of this story includes the adoption of Charles Spearman’s idea of a general criterion of intelligence (*g*) put forward in 1904, which is utterly at odds with the pluralist approach to intelligence defended by Binet, the use of racialist and racist conceptions of psychometrics in support of immigration restriction policies (Restriction Act, 1924), and of promoting policies of segregation against Black people, as well as eugenicist practices.⁴⁵ Especially strong was the stigmatization of Black people, whose “mental retardation” was previously explained by “scientific” theories such as craniometry and the evolutionary “principle of recapitulation” (reversal of the development process from adolescence onwards).⁴⁶ Its latest development was, at the end of the 20th century, the publication of the book *The Bell Curve*, where the allocation of an average IQ with a one standard deviation (15 points) difference between Blacks and Whites (“Caucasians”) is supposed to “explain” hereditary social differences and support policies hostile to social welfare.⁴⁷

⁴⁵ On this history, see GOULD, *The Mismeasure of Man*.

⁴⁶ See BLANCKAERT, “Natural Logic.”

⁴⁷ See GOULD, *The Mismeasure of Man*.

LOGICAL TESTS: SELECTING ON THE BASIS OF 'NATURAL' LOGICAL ABILITIES

Unlike intelligence tests, which are now carried out for assistance and orientation purposes, in the field of basic education and disability, logical reasoning tests are designed for selection purposes, on the basis of the spontaneous logical abilities displayed by candidates, in the field of higher education and at work. This practice became well established in the 1970s, intensified in the 1990s, and even more so during the 2000s, with, for example, the adoption of the TSA (Thinking Skill Assessment) at the universities of Cambridge, Oxford and UCL in the United Kingdom. It is connected to the democratization of higher education, of administrative employment and professional and managerial functions in enterprises. In this sense, we can see some similarities with the demographic crisis surrounding intelligence tests at the beginning of the 20th century, when the actual implementation of compulsory primary education in France had led to great heterogeneity in school populations, and made it necessary (according to the views of the time) to recruit children with intellectual deficiencies for special education, in order to extract them out of general education.

Unlike intelligence or IQ tests, the presence of logic is explicit in the title of these tests (many are called "logical reasoning tests") or in their description. Many aptitude or assessment tests are referred to by general terms such as "pre-employment logic tests" or contain partial tests dedicated to logic, even though it is often accompanied by tests dedicated to other more general skills. The actual content of the tests is also logical, with a significant number of questions relating to the correctness of a given reasoning, or the identification of a fallacy; we can even note the presence of "syllogisms" in tests of aptitude in deductive reasoning. Countless examples of these phenomena can be found, whether in published manuals, in websites dedicated to logical testing for candidates and employers, or in websites of universities and schools. Although there exists manuals precisely designed for helping preparing these tests, and although logical education is not completely absent from our education systems, as seen in the previous section, the quantitative and qualitative importance of the practices of logical testing shows that our societies are more interested in promoting selection based on embedded logical skills than in proposing a generalized and formal teaching of the argumentative codes actually used in intellectual elite exchanges, as was done during in the Middle Ages.

CONCLUSION

The study of the medieval situation of logic allows to point out irreversible changes, to trace long-lasting legacies and to suggest some stimulating parallels, but also to reflect on modern uses of logic from a different angle. The approach becomes especially fruitful when it focuses on a special moment in this history, that is the period when the intellectual, social and anthropological normativity of logic was being established within the world of medieval intellectual elites. It gave rise to vigorous policies of logical education, for the new student populations that were pouring into nascent universities, while it was philosophically reflected upon by the actors and decision-makers themselves. Logic was taught to all students, often deprived of any prior education, thereby offering a formal and explicit teaching of the very logical structures that were actually implemented in academic practices of evaluation and in intellectual exchanges. Discriminatory social uses of logic did exist, with the stigmatization and marginalization of ‘logically disabled’ people and the ‘clericalization’ of knowledge, from which laymen were excluded, but these were only one aspect of the normative power of logic. Today, by contrast, discriminatory aspects of logic dominate, without any foundational reflection, while the educational dimension of logic survives, but under a different name, critical thinking. Without claiming to go back to the logic classes given in the high schools of our grandparents, the study of the medieval experience, in a period of intense cultural and educational changes, at the birth of universities, shows an effort to formalize logical education, and to adapt it to generations of students who had not previously had access to higher education. It may be of interest to anyone engaged today in a reflection on the way argumentation can be taught to very heterogeneous student populations in a complex world.

A historical anthropology of logic also allows us to identify the Middle Ages as the period when the natural functioning of the mind was for the first time described as structurally identical with the divisions of Aristotelian logic. As a consequence of this naturalization, the logic taught in schools was conceived as “the” logic of our minds, while it was in fact just the product of a moment in the history of European intellectual elites, in the same manner as we can now conceive human thinking along the categories of the functioning of computers, and then call the latter “Artificial Intelligence”. The study of the uses and values bestowed on logic along time and

spaces thus helps pluralizing logic⁴⁸. By historicizing the normative dimension of logic, it becomes a powerful tool for putting in perspective, perhaps sometimes more efficiently than political or principled criticisms, any discourse that claims to evaluate on the basis of a “universal and natural” logic the degrees of rationality of individuals and groups whose intellectual behavior does not fit into the norm.

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⁴⁸ For a reflection on a fully historical, decolonized, global and multi-centered history of logic see BRUMBERG-CHAUMONT, “À l'Est (et au Far-Ouest) de la logique.”

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SOCIAL USES OF LOGIC IN MEDIEVAL AND MODERN CONTEXTS

S u m m a r y

During the Middle Ages, especially from the 13th century on, logic constituted a propaedeutic discipline for any form of higher education as well as an art of 'disputation' (*disputatio*), which represented both a scientific method and a compulsory performance for gaining university degrees, socially organized and controlled by teaching institutions. Logic was also newly regarded as a science and a technique for perfecting the intellect of men. It thereby received an unprecedented anthropological signification, while it led to relegate whole social groups, thought of as deprived of logic, to inferior forms of humanity. Medieval logic represented a dominant argumentative culture, doted with a strong normative significance.

Only the normative dimension of logic remains today, but to a large extent detached from its theoretical foundation and its educational value. Our era is characterized by the disappearance of a formal teaching of logic and by the end of the practice of disputation. The concept of intelligence has undergone major evolutions, while intellectual and scientific practices no longer follow a rigid and ritualized logical pattern. The very notion of logic has also changed radically, with a divorce between formal logic and the so-called 'informal logic,' and the disappearance the idea of logic as a unitary norm which came along the emergence of an irreducible logical pluralism. Social uses of logic are essentially discriminatory, as can be observed indirectly in intelligence tests and directly in logical tests, according to a selection program largely based on the identification of 'native' logical skills of the candidates. However, a concern for logical education, but under a different name, has re-emerged during the 20th century, with the critical thinking movement. The reflections and practices it led to offer interesting parallels with the medieval situation of logic.

The study of the medieval situation of logic allows to point out irreversible changes, to trace long-lasting legacies and stimulating parallels, but also to reflect on modern uses of logic from a different angle. The history of the uses and values bestowed on logic along time and spaces helps pluralizing and historicizing logic, especially when used as an instrument to evaluate on the basis of a 'universal and natural' logic the degrees of rationality of individuals and groups whose intellectual behavior does not fit into the norm.

Key words: logic; anthropology; education; intelligence testing; critical thinking.

SPOŁECZNE UŻYCIE LOGIKI
W KONTEKSTACH ŚREDNIOWIECZNYCH I NOWOCZESNYCH

Streszczenie

W średniowieczu, zwłaszcza od XIII wieku, logika stanowiła dyscyplinę propedeutyczną dla wszelkich form szkolnictwa wyższego, a także osnowę sztuki prowadzenia „sporu” (*disputatio*), która była zarówno metodą naukową, jak i obowiązkową formą zdobywania stopni uniwersyteckich, co miało społeczną organizację i było kontrolowane przez instytucje edukacyjne. Logika została również niedawno uznana za naukę i technikę doskonalenia ludzkiego intelektu. W ten sposób uzyskała bezprecedensowe znaczenie antropologiczne, prowadząc jednocześnie do zepchnięcia całych grup społecznych, uważanych za pozbawione logiki, do rangi podrzędnych form człowieczeństwa. Średniowieczna logika reprezentowała dominującą kulturę argumentacyjną o silnym znaczeniu normatywnym.

Dzisiaj pozostał tylko normatywny wymiar logiki, ale w dużej mierze oderwany od jej podstaw teoretycznych i wartości edukacyjnej. Naszą epokę charakteryzuje zanik formalnego nauczania logiki i koniec praktyki sporu. Pojęcie inteligencji przeszło poważne ewolucje, podczas gdy praktyki intelektualne i naukowe nie są już zgodne ze sztywnym i zrytualizowanym wzorcem logicznym. Samo pojęcie logiki również uległo radykalnej zmianie wraz z rozdzieleniem logiki formalnej i tak zwanej logiki nieformalnej oraz zniknięciem idei logiki jako jednolitej normy, która pojawiła się wraz z wyłonieniem się nieredukowalnego pluralizmu logicznego. Społeczne zastosowania logiki są zasadniczo dyskryminujące, co można zaobserwować pośrednio w testach inteligencji i bezpośrednio w testach logicznych, zgodnie z programem selekcji opartym w dużej mierze na identyfikacji „rodzimych” umiejętności logicznych kandydatów. Troska jednak o edukację logiczną, ale pod inną nazwą, pojawiła się ponownie w XX wieku wraz z ruchem krytycznego myślenia. Refleksje i praktyki, do których ów ruch doprowadził, oferują interesujące podobieństwa ze średniowiecznym usytuowaniem logiki.

Badanie średniowiecznego usytuowania logiki pozwala wskazać nieodwracalne zmiany, prześledzić długotrwałe dziedzictwo i pobudzające podobieństwa, ale także zastanowić się nad współczesnymi zastosowaniami logiki z innej perspektywy. Historia zastosowań i wartości nadanych logice w czasie i przestrzeni pomaga pluralizować i uhistoryczniać logikę, zwłaszcza gdy jest używana jako narzędzie do oceny na podstawie logiki „uniwersalnej i naturalnej” stopnia racjonalności jednostek i grup, których zachowanie intelektualne nie pasuje do normy.

Przełożył Stanisław Sarek

Słowa kluczowe: logika; antropologia; edukacja; testy inteligencji; krytyczne myślenie.