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TOWARDS THE PRAGMATIC CONCEPT OF KNOWLEDGES

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ABSTRACT

The article presents and justifies the thesis that the way of understanding knowledge has changed significantly over the last century. This change consists in departing from the classic definition of knowledge formulated by Plato, and in particular in questioning the subjective role of man as the holder of knowledge and abandoning claims to the truthfulness of knowledge. This process was an intensive evolution; its elements are given and justified in the text. Its source was a deep reconstruction of the mode of creating epistemic structures in mathematics and geometry, based on the abandonment of the principle of representation. Knowledge turned out to be determined by the social context, it became dispersed, decentralized, which led to the rejection of the condition of its truthfulness. The last phase of this evolution is knowledge as a phenomenon in the area of digital technologies, in particular artificial intelligence. This evolution has led to the emergence of many variants of knowledge that act as local knowledge, which justifies the use of the plural in this case.

Keywords: knowledge, metamathematics, artificial intelligence, sociology of knowledge, truth.

1. INTRODUCTION

This text attempts to justify an observation about the rapid change in the approach to the phenomenon of knowledge in the twentieth century; the change leads to the emergence of various variants of understanding knowledge, founding various social phenomena, and thus justifying the need to use the term “knowledges” (plural). Most of this movement takes place as a certain historical and social process, which draws attention to the pragmatic nature of the transformations and mainly concerns propositional knowledge, but, of course, it must also affect theoretical reflection. After all,

knowledge about knowledge is also a kind of knowledge, so the point of view based on the opposition between man and the world cannot be omitted here. It is fundamental to philosophy, as a prototype situation from the point of view of knowledge, interpreted as an effort to get to know the world by man. This kind of observation opens up an extremely extensive problem, exceeding the scope of this study, which focuses on gathering the basic premises of the observation made and putting in its light the thesis about the transformation of the way of understanding knowledge. This transformation at the starting point is based on the perception of knowledge as a certain state, resulting from communing with the world. Such thinking has its origins in the Platonic concept and persists until the end of the nineteenth century. The present state of the transformation mentioned above brings the idea of dispersed, diversified, and decentralized knowledge. The traditional quality of knowledge, which is its truth, is necessarily eroded. The concept of knowledge is also becoming the subject of intense analytical effort, which is reported, among others, by Burgin (Burgin, 2015).

In light of the emerging analyzes and phenomena, the issue of articulating knowledge, as well as its retention, has become significantly complicated. One of the most important contemporary fields in which the pragmatic approach to knowledge has led to unusual and previously unheard of implementations is technology, or more precisely digital technology. Philosophical attempts to combine the issues of knowledge and mathematics or logic are old and date back at least to the end of the nineteenth century, and taking into account the visions of Leibniz and Descartes, even earlier (Russell, Norvig, 2010). However, direct, technical attempts to formalize knowledge within computational technology appeared at the beginning of the second half of the twentieth century, opening a process that was revealed in an advanced way in the case of the so-called artificial intelligence. Due to the spectacular development of this field, especially within the so-called natural language processing, the topic of knowledge formalization seems to be one of the most important contemporary contexts of knowledge issues.

Knowledge has been the subject of philosophy since the beginning of European culture. Although a separate branch of philosophy called epistemology, understood as a self-conscious research procedure, is much younger, the concept of epistemology appeared in the 18th century. The most important questions that arise within it are given by Wolenski: "What is knowledge?; Is knowledge based on senses or reason? Is certainty attainable? What is truth? Are there ultimate limits of knowledge?" (Woleński, 2004, p. 4). Chisholm asks analogous questions somewhat differently, directly referring to the Platonic definition: "What can I know? How can I distinguish those things I am justified in believing from those things I am not justified in believing? And how can I decide whether I am

more justified in believing one thing than in believing another?" (Chisholm, 1989, p. 1).

Chisholm shows a clear shift of the problem towards the subject, which is indicated as the central instance. A similar view seems to prevail, especially in the basic or introductory approach, i.e. where we are not dealing so much with theory but rather with reporting the current, valid explanation. In a textbook on epistemology, Robert Audi expresses the underlying assumption directly. Giving examples of sources of knowledge, he lists the first and most important ones: perception, and then others: "memory as a storehouse of what we have learned in the past, consciousness as revealing our inner lives, reflection as a way to acquire knowledge of abstract matters, and testimony as a source of knowledge originally acquired by other people" (Audi, 2003, p. 1). By giving examples, he immediately refers to the human being. Writing how knowledge is produced, he emphasizes three acts in the course of which knowledge is perceived, believed, and justified by a certain ego. Duncan Pritchard confirms a strikingly similar approach: "Two things that just about every epistemologist agrees on are that a prerequisite for possessing knowledge is that one has a belief in the relevant proposition and that that belief must be true" (Pritchard, 2006, p. 5).

The views just quoted have one source, which is Plato. His views on knowledge are scattered throughout many dialogues, such as *Phaedo*, *Symposium*, *Republic*, *Timaeus*, *Sophist*, or *Statesman* (Burgin, 2015; Cornford, 1935). However, the best-known and quoted definition of it comes from *Theaetetus*, who expresses it in a dialogue with Socrates as overheard from someone whom the hero did not remember. In literature, it appears as a short phrase: *Dóksa alethés metá lógu*. Its English version, shortened to three words, reads *Justified True Belief*. It was mentioned here because Appiah argues that it "is a central philosophical claim [about knowledge] of the Western tradition since Plato" (Appiah, 2003, p. 43). The Polish translation is provided by Władysław Witwicki: "wiedza to jest sąd prawdziwy, ściśle ujęty" (Platon, 2002, p. 178). At the same time, he describes in a footnote the translation problems provided by the last term in the Greek version, derived from the term "logos" (λόγος). The choice made by Witwicki, i.e. this "ściśle ujęcie," corresponds with other traditions in this regard, e.g. the German: *das Wesen der Erklärung* (Plato, 1856, p. 208), English: *rational account* (Plato, 1987, p. 115), or French: *l'essence de leur definitione* (Deschoux, 1980, p. 289). Each time it is about a certain technical skill related to order and discipline of reasoning. For Plato, knowledge is a purely human disposition, and its status remained unchanged for over two thousand years. This assumption is emphasized by the use of the term *dóksa*. However, this quality of knowledge, as well as its second quality, i.e. truthfulness (*alethés*), will be challenged in the process of reconstructing knowledge understanding that took place in the 20th century.

In the twentieth century, the concept of knowledge began to be applied in new and hitherto unprecedented circumstances, in areas such as politics, the management, or the broader social life, taking on a slightly different shade in each of these contexts. It seems that the reason for this was undermining the key epistemic competence of man, which is the ability to express justified and true beliefs about the world, entering the area of no less basic and intuitive philosophical construction, which is a man confronted with the world. Such thinking is as old as Western culture, and its dominant rationalist interpretation is given by Descartes, who formulates the dualism of matter (*res extensa*) and mind (*res cogitans*) (Descartes, 1641). In this way, the mutual positioning of man and the world for the next 250 years is determined, creating a context for understanding knowledge that is the property of the mind and at the same time presupposes the existence of the world as a certain objective entity that can be comprehended by reason.

Around the second half of the nineteenth century, such an assumption rapidly eroded, caused by an epistemological crisis within mathematics and geometry, leading to a profound, paradigmatic shift in the way concepts that interpreted the nature of the world were constructed. This “digital transformation” (Maciąg, 2020), with deep epistemological foundations, also becomes an involuntary source of technology in which knowledge, due to practical necessity, is formalized, allowing for calculations to be made with the use of this knowledge. This understanding of knowledge is completely detached from the human being as its user and disposer, replaced by a more or less advanced artificial cognitive system. Knowledge in such a process is instrumentalized and adapted to the purposeful and utilitarian requirements of computing systems, performing clearly defined tasks of an “intelligent” nature, such as translating a text, answering questions about its content, understanding it, supplementing it, etc.

The next step, which also tears the notion of knowledge from the subject, is to place knowledge in a broader social context, which is formulated at the beginning of the twentieth century and developed in various ways later. This kind of conditioning has resulted in a multiple and dispersed image of knowledge, strongly relativized to the circumstances of its use. At the same time, this relativization resulted in a departure from the requirement of the truthfulness of knowledge, understood as the ability to represent the world. In its place, local and *ad hoc* variants appeared, causing the multiplication of many, numerous, and contingent knowledge in place of one true knowledge, producing a state of “the differend” (*le différend*), referring to the nomenclature given by Lyotard (Lyotard, 1983).

The interpretation proposed in this text, according to which knowledge is perceived as dispersed and multivariant while losing the connection with a man as its disposer and the attribute of truth in the sense of representing the world, is long-lasting and lasts from the end of the 19th century to the

end of the 20th century, but it brings about profound and significant effects. This interpretation is based on a pragmatic approach, based on an idea contained in the writings of philosophers such as John Dewey and Charles Sanders Peirce. Dewey writes: "In order to be able to attribute a meaning to concepts, one must be able to apply them to the existence. Now it is by means of action is made possible" (Dewey, 1931, p. 15). Peirce thinks similarly, writing a little earlier: "the rational purport of a word or other expression, lies exclusively in its conceivable bearing upon the conduct of life" (Peirce, 1905, p. 162). The study of the way of understanding knowledge based on a pragmatic approach necessarily becomes concluding the way of applying this concept, engaging social and historical contexts.

MAIN PRINCIPLES FOR A CHANGE IN THE WAY OF UNDERSTANDING KNOWLEDGE

The described process of changing the way of understanding knowledge and thus giving meaning to its concept, consisting in observing the ways of its use, as well as the effects it causes, is long and complex. The way to solve this problem is to present the main areas in which this change takes place. They provide specific premises for the proposed interpretation of the phenomenon of knowledge, although due to the breadth of this process, they are of various nature. They should be treated as important milestones in transformation of the understanding and use of the concept of knowledge, which, following the concept adopted here, are forming a coherent trend. The aforementioned premises are based on the following facts: (1) the epistemological paradigm shift that took place in the fields of mathematics and geometry in the second half of the 19th century and the beginning of the 20th century; (2) Karl Popper's concept which practically excludes the possibility of expressing constructive and sure judgments about the world; (3) The so-called Gettier problem, triggered by his article in which he shows the inconsistency of the Platonic definition of knowledge (Gettier, 1963); (4) a great project of relativizing human epistemic abilities and knowledge in relation to the social context, having many variants, developed in the 20th century; (5) pragmatic understanding of knowledge as a resource that can shape large-scale social phenomena, such as the knowledge society, perform the function of an organizational resource in economic processes, which has been collected under the banner of Knowledge Management (KM) or generate arbitrary, practical orders of knowledge what the field of Knowledge Organization (KO) does; (6) the emergence of knowledge as a resource that is the basis of artificial cognitive systems, with various levels of advancement, also as developed as the latest language models in the area of natural language processing (NLP).

1. First of all, the notion of change in the epistemological paradigm that took place at the end of the 19th century and the beginning of the 20th century due to mathematics and geometry needs to be clarified. Morris Kline places the deep causes of this change in the emerging ideas of the so-called non-Euclidean geometries. The two main projects of them by Nikolai Lobachevsky and János Bolayi appeared in the first half of the nineteenth century although they are the result of uncertainty about the so-called fifth postulate of Euclid's geometry, which appeared much earlier (Murawski, 2001). Their basic and simplest property was to completely ignore the experience of the geometry of the world, which was then apparent to the observer, and today it defines the common experience in this regard. These ideas opened the way to thinking in terms detached from this experience and opened up the possibility of reasoning unlimited by the necessity of conforming to it. Kline describes it as follows: "The two-thousand-year-old conviction that mathematics was the truth about nature was shattered. But the mathematical theories now recognized to be arbitrary had nevertheless proved useful in the study of nature. Though existing theories historically owe much to suggestions from nature, perhaps new theories constructed solely by the mind might also prove useful in the representation of nature. Mathematicians then should feel free to create arbitrary structures" (Kline, 1990, p. 1036).

Similar fundamental effects are noted by Luke Hodgkin in the context of the concept of numbers appearing in the works of Richard Dedekind, Gottlob Frege, and Giuseppe Peano. He wrote that the situation "did lead to a reshaping of mathematics if not the whole world-view" (Hodgkin, 2005, p. 215), because they have resulted in a "crisis of foundations," and thus the meaning and justification of basic material beings. They lost their ontological basis and became only assumed theoretical constructions: "the objects of mathematics were not actual things-in-themselves (as one thinks of a triangle, say, or the number '7'), but the rules which they obeyed" (Hodgkin, 2005, p. 216). From now on, mathematics and geometry cease to be stories about the world, they cease also to represent it, but when freed, they can produce their own structures, based solely on internal coherence resulting from the adopted assumptions. Kline describes the situation as a "loss of truth" and concludes that "By 1900 mathematics had broken away from reality; it had clearly and irretrievably lost its claim to the truth about nature, and had become the pursuit of necessary consequences of arbitrary axioms about meaningless things" (Kline, 1990, p. 1035). Although the very concept of the axiom is derived from Proclus, the independent authors of their contemporary idea are Giuseppe Peano (Peano, 1889) and David Hilbert (Hilbert, 1899).

The strategy of free, only internally disciplined speculation turns out to be effective. Not only does it not prevent their application to the physical

world, but it also allows one to overcome the disadvantages of human observation resulting from imperfect tools of cognition. The reversed direction of building models of the world necessarily has distant and, so to say, opposite effects: it causes a deep crisis of trust in various forms of apperception. This apperception covers not only the direct world of entities but also the rules governing that world, including the cause-and-effect principle as the basis for the functioning of the world. This fundamental breakthrough concerning human cognitive competencies and sources of knowledge makes its way into other areas of reflection, also of a humanistic nature, resulting in the so-called poststructuralism and postmodernism. These kinds of thread appear in the writings of Jean-François Lyotard, Jacques Derrida, as well as Gilles Deleuze, and Michel Foucault. The questioning of the cause-and-effect principle is realized directly as a completely new idea of complexity, which is built on two new descriptive structures that appeared at the beginning of the 20th century: network theory and systems theory. The idea of complexity allows one to understand the processes and phenomena of very different areas of reality, proposing an interpretation with a very high degree of universality.

The fruit of the mathematical debates that emerged at the end of the nineteenth century was, *inter alia*, Hilbert's program, consisting of 23 points, which, as Murawski writes, was "an attempt to justify the classical (infinite) mathematics and to save its integrity by showing that it is secure" (Murawski, 2010, p. 29). It aimed to stabilize and justify mathematical procedures and constructions by introducing defined axioms and proving rules, allowing one to build the foundations of mathematics. In section ten, Hilbert formulates the question which Roger Penrose summarizes as follows: "is there some general mechanical procedure which could, *in principle*, solve all the problems of mathematics (belonging to some suitably well-defined class) one after the other?" (Penrose, 1999, p. 34). This question was taken up by Alan Mathison Turing. To prove the impossibility of such a procedure, he proposes a theoretical machine that becomes a conceptual prototype of a modern computer. Its computational mode of operation determines its further development, which also applies to knowledge, which is subject to appropriate reconstruction (formalization) to meet technical requirements. The invention of the computer and the subsequent incorporation of the phenomenon of knowledge into digital technology, therefore has the same origins as the fundamental and less known epistemological revolution that took place in mathematics and geometry. It also implements an analogous set of epistemological assumptions, based on arbitrary interpretative procedures, which at the epistemic level are conceptual in nature, but at the level of the technical apparatus, they come down to certain practical procedures (the so-called digitization). Both variants strongly influence the phenomenon of knowledge, leading to its actual instrumentalization, taking place at different levels of interpretation: theoretical and practical.

2. The described revolution becomes the source of a change in the approach to the place which is by definition the field of creating knowledge, i.e. science, which in this text represents the second premise. In this way, one can interpret the concept of Karl Popper, which he presented in *Logik der Forschung: Zur Erkenntnistheorie der Modernen Naturwissenschaft (The Logic of a Scientific Discovery: On the Epistemology of Modern Science)* (Popper, 1935). Two arguments can be given to support this thesis. First, the idea of falsificationism is, in fact, a very strong blow to the epistemic certainty enjoyed by science, especially the one based on mathematical modeling. Observing the historical development of knowledge, Popper presents a deep epistemological pessimism, noting that there is no possibility of an absolute and certain judgment of the correctness of a theory, condemning any theory to uncertainty in this regard. The only kind of certainty that can be achieved is nonconstructive and only arises when the theory is overthrown. However, this approach is, in fact, a voice for epistemological relativism, for the practical differentiation of the real world and the world of interpretation of reality. The latter world is inherently “arbitrary” in the sense that it is fundamentally deprived of access to the real world and cannot realize the relationship of strict correspondence. It is limited to continuous trials that are always uncertain and ultimately inappropriate.

Second, Popper formulates the conditions of the theory in an extremely interesting and bold way, clearly referring to the assumptions of axiomatic systems in at least two places. First by pointing to the source of a theory which, in his own words, could come from everywhere, from: “an anticipation, a hypothesis, a theoretical system, or what you will” (Popper, 2002, p. 9). The second place is the description of „different lines along which the testing of a theory could be carried out.” For this, in the first place the “internal consistency of the system” is examined (*ibidem*), which sounds like a reference to the axiomatic systems of Peano and Hilbert. In his conception, Popper clearly weakens the position of scientific knowledge and even challenges it in a peculiar way, and at the same time, at least partially, frees it from the close relationship with the world. Both these movements seem consistent and open the way to perceiving knowledge, this time scientific, completely different from the image of it that arises with Galileo, who was convinced of discovering the real (mathematical) properties of the world through science.

3. Another premise indicating a change in the understanding of knowledge is provided by Edmund Gettier, the author of the article that shocked the foundations of epistemology (Gettier, 1963). This light tone is justified by the somewhat anecdotal setting of this event and the extremely small volume of the three-page text that accomplished this feat. Using two examples, which actually exhaust the volume of the text, Gettier proves that one can have justified and truthful beliefs, and thus fulfill Plato’s conditions

and have no knowledge. In this way, it shows the inaccuracy in reasoning, which leads to the recognition of the hitherto existing definition of knowledge as defective. Admittedly, similar examples are given earlier by Meinong and Russell, but they do not draw so far-reaching conclusions. The latter writes in 1948 that “It is very easy to give examples of true beliefs that are not knowledge,” adding that knowledge is a subclass of these judgments: “Every case of knowledge is a case of true belief, but not vice versa” (Russell, 1948, p. 170).

Gettier’s text opened a rich and still unfinished discussion on the problem that bears his name. The number of proposals, even exceeding the number of its participants (Borges *et al.*, 2018). They propose two main ways of looking for a solution: introduce the fourth condition to the incomplete three proposed by Plato, or focus on the third condition in the original Greek wording, i.e. referring to the concept of logos, and give it stricter, noncontestable character (Moser, 2010). From the point of view of this text, it is worth quoting Sober who summarizes Gettier’s problem as follows:

“The skeptical argument contradicts a fundamental part of our commonsense picture of the way we related to the world around us. Common sense says that people have knowledge about the world they inhabit; the skeptical argument says that common sense is mistaken in this respect.” (Sober, 2005, p. 157)

In this statement, he refers to common experience, pointing to a certain banality of the situation described by Gettier, and at the same time, locating it in the world of a certain everyday life completely abandons speculation. In this way, knowledge, which is after all the main subject of reflection, acquires a practical nature.

Following this path and examining the pragmatic foundation of the presented thought, we quickly face the necessity of a deeper examination of the examples of Gettier and others similar to certain stories that must also happen as meta-stories about knowledge. Their meaning results from the special position of their reader (and author), who must have a certain special, higher knowledge, coming from a level higher than the world presented in the examples. This type of perspective cannot be ignored when examining the conditions of the existence of knowledge, which can reveal itself at any level of the analysis and cannot be deprived of participation in the analysis at any of them. Such an observation is, of course, endowing knowledge with a quality such as semantic dispersion and contextual dependence. This reasoning is modeled on Tarski’s approach, who distinguished different types of language that was based precisely on the diversification of the levels of its existence. He differentiated the level (and language) of direct talking about the world and the meta-level (metalanguage). The latter makes it possible to establish the rules for the first utterance (Tarski, 1933). There is no place here for a broader analysis of this issue, which I have presented elsewhere,

but it leads directly to the understanding of one of the most important aspects of the decomposition of knowledge, referring directly to the inspiration taken from the crisis of the mathematical description of the world, described earlier and finally to the process of relativizing knowledge.

4. The next, fourth premise of the idea of knowledges concerns the phenomenon both easy and difficult to present. Its apparent ease lies in the specific consistency of assumptions referring to the social context of the described phenomena, the description of which proves to be difficult due to their quantity, variety, and interrelationships. The latter difficulty is also paradoxically helpful; reflection in this area is extensive and well-known, so in this text it is enough to recall the most important facts. The perspective of knowledge as a hostage of social circumstances, as Marian Adolf and Nico Stehr claim, appears in the writings of classics researching social reality, such as Max Weber, Max Scheler, Karl Marx, Karl Mannheim, Georg Simmel, and Emil Durkheim (Adolf, Stehr, 2014). Among them, it was Scheler who in 1924 proposed the idea of the sociology of knowledge, proposing the appropriate concept: *Wissenssoziologie*. Adolf and Stehr, however, nominate Karl Mannheim as the proper father of the sociology of knowledge, who devotes a separate chapter to it in his work from 1929 entitled *Ideology und Utopie* (Ideology and Utopia). The emblematic representative of this direction and its further development is David Bloor, one of the co-founders and main representatives of the so-called *strong programme*, i.e. a research school, named after the place of its inception the Edinburgh School. He presents his views in a book *Knowledge and Social Imagery*, published in 1976, which is still a kind of key reference for the sociology of knowledge. It includes the following sentence: “instead of defining it [knowledge] as true belief—or perhaps, justified true belief—knowledge for the sociologist is whatever people take to be knowledge. It consists of those beliefs which people confidently hold to and live by” (Bloor, 1991, p. 5), openly contesting the Platonic conditions of knowledge to which he directly refers.

The sociology of knowledge, as part of the project of its social conditioning, is supplemented by the sociology of science, which can also be understood as a field of realization of scientific knowledge, i.e. knowledge that is a subject of the methodological conditions of its correctness. These conditions, stable until the end of the nineteenth century, based primarily on the certainty of mathematical judgments, turned out to be questioned. A rich trend of reflection in this field is opened by Ludwik Fleck, whose concepts, presented in 1936, are an inspiration both for Thomas Kuhn and his ideas of scientific revolutions and for Bruno Latour. Latour also, as Sady points out, nominates Fleck as the father of the sociology of science (Sady, 2013, p. 211). Kuhn represents a very general type of approach, trying to synthesize the processes of the development of science, approaching the philosophy of science. Paul Feyerabend and Imre Lakatos share a similar, constructive ap-

proach. The views of all three constitute mainly a phenomenon described as a “historical turn” in the understanding of science (Bird, 2008).

The trend represented by Latour is much closer to the social reality and the institution belonging to it, which is the laboratory, i.e. a place specially constructed for acquiring knowledge. This is the direction of publications of Robert Merton from 1973 (Merton, 1973), Steven Woolgar and Bruno Latour from 1979 (Latour, Woolgar, 1979), or Karina Knorr-Cetina from 1981 (Knorr-Cetina, 1981). This research develops, creating its own field of reflection called Science and Technology Studies (STS), the basic assumptions of which were formulated in 1991 by Steve Woolgar (Woolgar, 1991). Latour, who, as he writes about himself, developed the sociology of science in the 1980s, ultimately built an extremely important and extensive social theory, going far beyond the strict field of science or knowledge. This type of approach, representing a philosophical approach to the social and historical circumstances of the existence of knowledge, is also represented by philosophers such as Foucault or Lyotard. This multi-threaded, extensive and different reflection on knowledge, also in its scientific embodiment, is at the same time an extensive story about the whole of society and therefore also its political, economic, and anthropological contexts. It is also a great break with the idea of knowledge, empowered transcendently or metaphysically. Instead, knowledge is reduced to its numerous, dispersed, often not obvious and surprising, but permanently present, social contexts, leading to its diversification.

5. The contexts mentioned in the previous paragraph lead us immediately to the next, fifth premise of the reasoning presented in this text. It consists of three elements, or more precisely, three different articulations of the concept of knowledge that appears as a term in three different areas of reflection and use. These reflections, however, have a general common feature and differ only in the scale or nature of their implementation. All of them treat knowledge in a reified, instrumentalized way, perceiving it as a physical entity that can be used and utilized, and thus becomes a part of wider processes. The first reflection is created by the philosophers mentioned here: Foucault and Lyotard, among whom the latter, in particular, sees knowledge as a component of substantive social processes leading to political consequences. He writes about knowledge, which, according to him, should be widely available by endowing it with electronic character but also may constitute the main component of political domination (Lyotard, 1979). This kind of approach continues a slightly earlier concept by Graham Bell in his book *The Coming of Post-industrial Society: A Venture in Social Forecasting* from 1973, which develops the theses presented by Fritz Machlup in 1962. According to what Peter Drucker writes about himself, this approach is initiated by him with a text from 1961. The quoted texts gradually move forward in identifying the social role of knowledge, ultimately making it the

basis of the functioning of society, understanding this conclusion operationally, as a result of its economic and political role, perceived directly as a factor of advantage and power. Knowledge is understood as a resource that gradually plays an increasingly important market role and inevitably becomes a kind of unusual good or even a natural resource.

The political level must therefore be supplemented with a purely technical level of use, at which knowledge becomes the subject of management at the level of an organization, most often an enterprise, which classifies it as one of its more and more valuable resources. This kind of understanding of knowledge, purely instrumental, utilitarian, and practical, appears in the relevant branch of management: knowledge management (KM). Kimiz Dalkir, an author of the textbook *Knowledge Management*, defines it as follows:

“Knowledge management represents a deliberate and systematic approach to ensure the full utilization of the organization’s knowledge base, coupled with the potential of individual skills, competencies, thoughts, innovations, and ideas to create a more efficient and effective organization.” (Dalkir, 2005, p. 2)

This definition is somewhat of a compromise, as Dalkir has found over a hundred similar ones, most of which are correct. This situation results from the fact that this management turns out to be extremely heterogeneous and dependent on the research context, which may be surprisingly different in nature. Dalkir gives an impressive list of examples of such contexts:

“organizational science, cognitive science, linguistics, and computational linguistics, information technologies such as knowledge-based systems, document and information management, electronic performance support systems, and database technologies, information and library science, technical writing and journalism, anthropology and sociology, education and training, storytelling and communication studies, collaborative technologies such as computer supported collaborative work and groupware, as well as intranets, extranets, portals, and other web technologies.” (Dalkir, 2005, p. 6)

It turns out, therefore, that the knowledge of an organization can be revealed in different ways what is caused by the way it is understood. On the other hand, pragmatism in the approach to knowledge in this area is not only utilitarian and instrumental, but above all extremely unambiguous: the only goal is effective and orderly use of knowledge. A number of practical methods serve this purpose, the list of which is opened by Nonaka’s classic proposal, entitled SECI (Socialisation, Externalisation, Combination, and Internalization) (Nonaka, 1991; Nonaka, Takeuchi, 1991). This is how another knowledge management classic, Karl Wiig, interprets also the role of knowledge. Ultimately, it serves two, not very complicated purposes: it is to make the company function intelligently, making the best use of the knowledge resources it has at its disposal (Wiig, 1997). Wiig formulates

them in a text summarizing the history of knowledge management from 1997. Maximizing efficiency—using the nomenclature proposed by him—is clearly presented there in an appropriate scheme presenting individual main tasks and their operational implementation. Wiig also presents the chronology of the formation of this management, which shows that it developed rapidly in the 1990s and, apart from very early ideas, gradually matured in the 1980s. It is, therefore, undoubtedly a continuation and operationalization of earlier political or philosophical ideas.

The last of the three different contexts in which knowledge appears as a useful object or resource is the area of reflection known as the Knowledge Organization (KO). Its real source is a library in which knowledge is gathered in a tedious cataloging process, allowing access to an extensive, spontaneously accumulating repository. This initially technical process, however, immediately updates questions about the structure of the knowledge and ultimately about its content. The birth of the concept of knowledge organization is reported by Hider who writes: “The term ‘knowledge organization’ was chosen for the English name to represent wider interests than classification, although these did not at first extend to other IO [Information Organization] activities such as descriptive cataloging; it was abstract rather than recorded knowledge that was to be organized into schemes and vocabularies” (Hider, 2018).

Its mature version is given by the main author of this reflection, Birger Hjørland: “KO is about describing, representing, filing and organizing documents and document representations as well as subjects and concepts both by humans and by computer programs” (Hjørland, 2016). The effect of development is also his specific understanding of knowledge that modifies the subject. Hjørland turns it into an idea he calls “knowledge claims” (Hjørland, 2003, p. 100). This movement allows him to understand, on the one hand, the multitude of interpretations of the world within knowledge, and, on the other hand, the variety of structures organizing this knowledge. The shift of knowledge towards its claims, and then concepts, is, however, an admission of its dispersion and confusion, articulating the most important experience born in the observation of technical stores of knowledge. Ultimately, however, the goal remains the same: it is the exploitation of knowledge, its extraction, and use, which allows the Knowledge Organization to be placed next to the previous approaches, which build the fifth premise of the thesis of relativizing knowledge and its reification at the same time.

6. The last, sixth premise refers to the field of events that are happening intensively today, although they are the result of many years of research, dating back to the mid-twentieth century, and the sources of which are even earlier. It also concerns a very specific field, which is digital technology. These searches are also in the phase of spectacular development, considering the number of publications and solutions appearing for example in the

area of the so-called artificial intelligence. Artificial intelligence is also the traditional and oldest field of knowledge exploitation in information technology (IT), dealing with the problem of the so-called knowledge representation, or more specifically, knowledge representation and reasoning. As Jurfsky and Martin write, the first ideas of this kind appeared as early as 1957 (Jurafsky, Martin, 2020, p. 329), while the famous conference at Dartmouth College in 1956 is considered to be the symbolic birth of artificial intelligence (Flasiński, 2016, p. 4). However, artificial intelligence searches for its philosophical foundations in terms of knowledge much earlier. Russell and Norvig, authors of a classic textbook in this area, write that “Aristotle argued (in *De Motu Animalium*) that actions are justified by a logical connection between goals and knowledge of the action’s outcome” (Russell, Norvig, 2010, p. 7), at the same time formulating the most important aspect of understanding knowledge emerging as an issue in the area of artificial intelligence, which is practical and purposeful utility. This opinion is also critically important from the point of view of this paper because it breaks definitively the direct link between knowledge and man, which ultimately leads to appreciating an artificial system, which is a product of technology, a full-fledged disposer of knowledge.

Knowledge representation is a very extensive field. It is based on the assumption that knowledge can be represented using formal structures, for example logical, and this logic can be very various. The proposals that have developed in this field during its many years of development are numerous (Brachman, Levesque, 2004; Van Harmelen *et al.*, 2008). However, as Russell and Norvig write:

“Much of the early work in *knowledge representation* (the study of how to put knowledge into a form that a computer can reason with) was tied to language and informed by research in linguistics, which was connected in turn to decades of work on the philosophical analysis of language.” (Russell and Norvig, 2010, p. 16)

This observation is also valid today, although the approach to language has changed fundamentally.

To understand the importance and type of knowledge used in the most important solutions in the field of artificial intelligence, i.e. deep learning—the technology of artificial neural networks, one can base on the basic characteristics of knowledge presented by Mariusz Flasiński in his textbook (Flasiński, 2016). It breaks down into two basic approaches, the rivalry of which reflects not only the historical development of artificial intelligence but also the hopes and disappointments associated with it. This emotional context is not only anecdotal, but illustrates the special importance of technology that ultimately mimics human action or thinking, or at least rational action or thinking, referring to the characteristics given by Russell and

Norvig (Russell, Norvig, 2010, p. 2). Flasiński points to two historical approaches: the so-called symbolic artificial intelligence and the so-called computational intelligence. In the first one, knowledge is symbolically represented (in the form of graphs, logical formulas, or symbolic rules) and is explicit. In the second approach, the representation of knowledge is numerical and implicit. Knowledge is, as in the connectionist model, distributed in a form of individual numerical values (e.g. weights in artificial neural networks) which cannot be directly interpreted semantically (Flasiński, 2016). Historically, the second approach is older and opens up the history of artificial intelligence, but the symbolic trend has dominated since the 1970s. More or less at the turn of the 20th and 19th centuries, however, it experiences a breakdown and loses its importance due to the restored connectionist approach. This approach is developing rapidly and spectacularly until today, bringing, among others, language models capable of performing complex cognitive operations, such as text understanding, question answering, etc. Such skills are shown by models from the GPT family (Generative Pre-trained Transformer). The latest version: GPT-3 (Brown et al., 2020) currently shows the state-of-art of development in the field of natural language processing (NLP).

Another and equally spectacular field of development of digital technology related to knowledge is the area of data acquisition and analysis, having various technical implementations known under names such as Big Data, data mining, Internet of Things (IoT), etc. These technologies obviously work together in conjunction and create a certain technological universe, combining various solutions that pursue different particular goals of their stakeholders. One of them is information gathering and knowledge gathering. Big data, as Misa Kinoshita and Kijima Mizuno write “represent projections of things on real world, thinking of people, results of calculations of computer” (Kinoshita, Mizuno, 2017, p. 92), it is, therefore, a powerful and ever-growing digital source of knowledge. It is available in the so-called Knowledge Discovery, which is the central task of the technology called data mining. It is, as Bramer writes, “non-trivial extraction of implicit, previously unknown and potentially useful information from data” (Bramer, 2016, p. 2).

A characteristic feature of the modern approach to data is its holistic nature, resulting from the total area of their presence. In other words, data, in the sense given by Kinoshita and Mizuno, cover more and more areas of the world and penetrate deeper and deeper into its processes and phenomena. Of course, for this reason, they also become a source of serious ethical problems (Chandler, Fuchs, 2019). They also raise the question of the type and status of knowledge they become. Insights emerging in this field, for example, knowledge extraction based on large virtual social networks (e.g. Facebook), show its extraordinary diversity, multivariant or even contradiction, activate the need to understand the social processes of its construction and

proliferation, etc. From this point of view, modern technologies of data acquisition and analysis turn out to be great repositories of distributed knowledge, with surprising forms of articulation and not obvious in terms of their relationship with individual people.

CONCLUSIONS

The historical reconnaissance of the contexts in which the concept of knowledge appears here clearly shows the significant evolution of the idea of knowledge. Today knowledge deviates from its Platonic definition, in particular abandons man as its disposer and abandons the condition of truthfulness. This evolution takes place first as a result of a fundamental change concerning the possibility of representing the world by epistemological human constructions, or more precisely, the rejection of this possibility entirely in favor of arbitrary, free constructions, meeting only the condition of assumed, internal coherence.

The second most important movement leading to the erosion of understanding of knowledge is placing it in the context of social reality, based on the assumed close, mutual relationship. This movement is expressed by a whole range of ideas, that produce the need to reconstruct the conditions of cognition. This need is similar to the one previously described, but this time it is caused in fact by the redefinition of key subjective features. It consists of departing from the essential interpretation in favor of the social one. It is, of course, also a dramatic process and full of numerous consequences, also concerning knowledge, which turns out to be socially determined, which causes its dispersion, decentralization, and eliminates the condition of truthfulness. At the same time, by becoming a hostage of historical and social circumstances, knowledge is reified and interpreted as a resource or good, thus becoming a source of further social and political transformations.

The third and most important variant of knowledge reinterpretation appears as a result of digital technologies. Here, too, knowledge is subject to concretization, which is of a formal or even numerical nature. The approach to it is strictly instrumental, teleological, and utilitarian. Knowledge becomes a local phenomenon and is subject to computational processes.

The accumulated premises justify an evolution in which knowledge is understood as dispersed (distributed). On the one hand, this dispersion concerns the level of reflection, which means that a cognitive event that causes the referent of the concept of knowledge becomes heterogeneous and local because of the interpretative approach adopted. On the other hand, the characteristic of dispersion is also observed at the direct level of articulation of knowledge that does not claim uniformity, which is closely correlated with the removal of the requirement of truthfulness. In this situation, it be-

comes justified to introduce the plural in the modern conception and practice of knowledge, i.e. the concept of “knowledges,” which defines the current way of existence of knowledge.

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