THE SOCIAL SPACE OF DOUBT: DENIALISM, SKEPTICISM AND THE CONSTRUCTION OF KNOWLEDGE

O ESPAÇO SOCIAL DA DÚVIDA: NEGACIONISMO, CETICISMO E A CONSTRUÇÃO DO CONHECIMENTO

EL ESPACIO SOCIAL DE LA DUDA: EL NEGACIONISMO, EL ESCEPTICISMO Y LA CONSTRUCCIÓN DEL CONOCIMIENTO

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ABSTRACT: It might seem that any restriction on doubting is contrary to the progression of knowledge and undemocratic. This argument is used by different flavors of denialism. However, an examination of the way doubts work shows us that there are epistemic requirements for the legitimacy of doubt that are not met by denialisms. A consequence of this argument is that epistemic normativity is not absorbed by political normativity. The specificity of epistemic normativity, which explains why denialists' doubt is not legitimate, disappears in constructivist theories. Constructivist theses result from a confusion between the fact that theories are social constructs and the thesis that they construct the facts upon which the theory itself stands. The legitimacy of doubt depends on epistemic social filtering processes. Socially constructed epistemic filters reflect a profound fact of the evolution of human culture: the cumulative, social and asymmetrical production of knowledge.

KEYWORDS: Denialism. Skepticism. Doubts. Epistemology. Constructivism.

***RESUMO**: À primeira vista, pode-se pensar que toda restrição à dúvida é contrária à progressão do conhecimento e antidemocrática. Este argumento é utilizado por diferentes sabores de negacionismo. No entanto, um exame do modo como funcionam dúvidas nos mostra que existem exigências epistêmicas para a legitimidade da dúvida que não são satisfeitas pelos negacionismos. Uma consequência deste argumento é que a normatividade epistêmica não é absorvida pela normatividade política. A especificidade da normatividade epistêmica que explica porque a dúvida de negacionistas não é legítima, desaparece em teorias construtivistas. Teses construtivistas resultam de uma confusão entre o fato de teorias serem construtos sociais e a tese que elas constroem os fatos sobre os quais portam a teoria ela mesma. A legitimidade da dúvida depende de processos sociais de filtragem epistêmica. Os filtros epistêmicos socialmente construídos refletem um fato profundo da evolução da cultura humana: a produção cumulativa, social e assimétrica do conhecimento.*

***PALAVRAS-CHAVE**: Negacionismo. Ceticismo. Dúvida. Epistemologia. Construtivismo.*

***RESUMEN**: Podría parecer que cualquier restricción a la duda es contraria a la progresión del conocimiento y antidemocrática. Este argumento es utilizado por diferentes tipos de negacionismos. Sin embargo, un examen de la forma en que funcionan las dudas nos muestra que existen requisitos epistémicos para la legitimidad de la duda que no se cumplen con los negacionismos. Una consecuencia de este argumento es que la normatividad epistémica no es absorbida por la normatividad política. La especificidad de la normatividad epistémica, que explica por qué la duda de los negacionistas no es legítima, desaparece en las teorías constructivistas. Las tesis constructivistas resultan de una confusión entre el hecho de que las teorías son construcciones sociales y la tesis de que construyen los hechos sobre los que se sustenta la teoría misma. La legitimidad de la duda depende de procesos sociales de filtración epistémica. Los filtros epistémicos construidos socialmente reflejan un hecho profundo de la evolución de la cultura humana: la producción acumulativa, social y asimétrica de conocimiento.*

***PALABRAS CLAVE**: Negacionismo. Escepticismo. Duda. Epistemología. Constructivismo.*

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Introduction

> The Enlightenment is consuming its own progeny. In the west, the culture of reason is dying, brought down by a loss of faith in progress and in the rationality that underpinned it. The replacement of objective truth by subjective experience has caused science itself to turn into a branch of unreason, underpinning the loss of rational discourse as evidence is hijacked by ideology (PHILLIPS, 2017, p. 1, our translation).

Author Melanie Phillips' assessment, in the lines quoted above, seems to represent a consensual description of scientific denialism. It is not certain that the mention of the West is adequate. However, once this difference is discounted, it is an initial entry into the negative epistemic evaluation of the set of phenomena that includes denialism about global warming and the anti-vaccination movement. However, the author of these lines is herself a denialist about global warming and a supporter of the anti-vaccination movement (MELANIE PHILLIPS, 2022).

This is not the first time that a position has been justified with words that seem to mean the exact opposite of what is advocated. Everyone is free to use the words as they like, and for words with such an underdetermined meaning as 'rationality' or 'progress' there is unlikely to be a definition that would allow one side to be right about the meaning of the terms used. Discussing the meaning of 'rationality' and pretending that this discussion would change something in the positions in question is more or less as useless as arguing about the true meaning of 'democracy' and pretending that, once this semantic discussion is resolved, some political conflict would be solved. Disagreements of this kind about the meaning of words are a more or less direct reflection of the positions defended in the domain about which the discussion is carried out – it is quite possible that this is a trait of essentially contested concepts (GALLIE, 1956).

There is no kind of epistemic reason to accept the denialism defended by the author. Her positions are unscientific and irrational. Despite this, there is a dimension of rationality and science, or at least close to rationality and science, which is captured by the use of terms by the author of the lines above. My aim in this article is to show how this paradoxical situation occurs.

In the first section, I will expose the use of doubt in denialist discourses, using the work of Oreskes and Conway. In the second section, I will draw a distinction between science and pseudoscience based on Oreskes' answer to the question “why trust the sciences?” A debate about the legitimacy of skeptical doubt is the subject of the third section, with the results that will be extended to denialism in the fourth section. Discussions around the legitimacy of

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different types of doubt will lead us to reconsider the social dimension of knowledge production in the fifth section.

The Strategy of Doubt

A lead on how to enter this debate is to explore the mimetic dimension of scientific denialism, which seek to present itself in the form of a science, for example, through texts in the format of scientific papers, which Oreskes (2019a) calls “facsimile sciences”. An example of facsimile science is found in Andrew Snelling's (2014) effort to answer the question, "How did freshwater fish survive during the great flood?" For those who believe this kind of story, the answer should be that whoever caused the flood found a solution to this problem, which, at first glance, seems no more mysterious than the preservation of all terrestrial species in a big boat. However, Snelling (2014) considered this problem, or rather the question of how fish survived during the flood, since the Bible says nothing about the salinity of the water in the “creation week”. His answer involves the separation between different layers of water with different salt concentrations, due to the difference in density, and examples of fish species capable of living in fresh and salt water.

It is a fanciful solution to an imaginary problem, more or less like knowing how Saci Pererê runs on one leg. The text was published in a book dedicated to creationism and resumed on a creationist website, not in a scientific journal. However, the publication seems to represent scientific knowledge: it cites scientific manuals and its language is at least partially similar to that of a scientific paper. This is the very form of pseudoscience, even if it is likely to be marginal to those who believe in a universal flood.

Facsimile sciences do not explain the lines mentioned at the opening of the text. In the quoted text, the denialist who revolts against the denial of science adopts a, let's say, metatheoretical posture, and does not advance the defense of a specific thesis. To understand this type of argument, I will follow another lead, pointed out by Oreskes and Conway (2010), taking anthropogenic global warming (AGW) as an example.

Climatologists are virtually unanimous in considering that global warming is a real phenomenon and that human activity is its cause: “more than 95% of climate researchers agree that human activity is causing global warming, and that without action to combat it we are on a path to dangerous temperature rises from pre-industrial levels” (RUNCIMAN, 2017, n.p. , our translation). The bases for accepting the AGW range from changes in the structure of

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ecosystems to the variation in the distribution of species across the globe, from the increase in extreme weather phenomena to the history of climate change throughout Earth's history (IPCC, 2022).

Global warming cannot be measured by a layman, equipped with a thermometer and a notebook, or by someone who notices a cold wave in Rome in May, as suggested by former Brazilian Foreign Minister Ernesto Araújo (MIGUEL, 2020). The evidence of a scientific theory is not directly accessible to ordinary experience and, even with the data used by science, its interpretation demands specific formation. What is rational here is alignment to the position of experts. However, there is a huge mismatch between the massive consensus of experts about AGW and its perception in society (LEWANDOWSKY; GIGNAC; OBERAVE, 2015; WATTS, 2019). How to explain this mismatch?

A first hypothesis is that it is a cognitive problem. If the acceptance of scientific results depends on people's scientific background, the greater a person's scientific knowledge, the greater the convergence between what science says and what they believe. This hypothesis is called the 'Science Comprehension Thesis' (SCT). As an individual's political position is a strong indicator of their perception of the risks associated with global warming, SCT can be tested by the difference that scientific formation produces, given the agent's political position.

Those who have hierarchical and individualistic values tend to be skeptical about AGW, whereas those who have a communitarian egalitarian view tend to accept the risks associated with AGW – this is the terminology of Kahan *et al.* (2012), who identify, respectively, positions on the right and left of the political spectrum.

SCT predicts that AGW refusal should decrease for individuals who have higher scores on tests of scientific and mathematical knowledge. Now, what happens is exactly the opposite: among those who have individualistic hierarchical values, the better the scientific formation, the greater the skepticism in relation to the AGW. The explanation of the distribution of denialism about AGW is therefore not cognitive. Kahan *et al.* (2007) explain this distribution by the 'cultural cognition thesis' (CCT): for beliefs that have some role in forming the identity of groups, individuals tend to align their positions with those of the group with which they identify – it is a form of “identity-protective cognition” (KAHAN *et al.* 2012; KAHAN *et al.* 2007).

This explanation is on the side of the reception of theses for and against the AGW. There is another component that is on the supply side of a denialist thesis. The mere denial of a scientific thesis is unstable without an alternative explanation that provides a lifeline for

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denialists. Here, the denialist offer has its origins in a campaign carried out by the oil industry to create a feeling of doubt in the public about the reality of the phenomenon.

As Oreskes and Conway (2010) showed, the oil industry campaign used the same strategy previously used by the tobacco industry, to question the relationship between tobacco and cancer, and by the chemical industry, to question the relationship between the use of aerosols and damage to the ozone layer. By creating a sense of doubt about the explanation that represents the consensus of the scientific community and offering an alternative that has at least the appearance of a legitimate explanation, the oil industry facilitates the adherence of individuals to theses that are more compatible with their values. The construction and dissemination of this alternative narrative, financed by right-wing think tanks in the United States, has doubt as its central element.

> Ever since climate became a political issue in the 1980s, the big oil companies have been funding an extensive PR operation to raise questions about the strength of the evidence. ExxonMobil alone has spent more than $240m on public relations in this area in the past two decades. […] The currency in which these campaigns trade is doubt. Their goal is to sow uncertainty in the public mind about what the science shows. In the words of an American Petroleum Institute action plan from 1998: "Victory will be achieved when average citizens 'understand' uncertainties in climate science." (RUNCIMAN, 2017, n.p., our translation).

The deliberate creation of doubt about the AGW is continuous and extends to the determination of the curriculum and the language used in textbooks at all school levels, from basic education onwards (WORTH, 1998).

There is enormous cunning in this strategy, which consists in saying that the denial of the anthropogenic origin of global warming is not only anti-democratic, but anti-scientific:

> Framing it as a contest between heterodoxy and orthodoxy fits the language of scepticism. In that way, it can be made to appear consistent with both science and democracy. Democracy needs dissent in order to function. Scientific progress depends on people being willing to challenge the conventional wisdom. Many climate sceptics argue that they are the ones on the side of science, because the currency of science is doubt. But when heterodox opinion gets purchased with hard cash, it cements the triumph of cynicism (RUNCIMAN, 2017, n.p., our translation).

But how can it be scientific to support a position rejected by almost all specialists in the area in question? How can the key to the relationship between democracy and knowledge lie in a campaign sponsored by an industry with direct interests in the theses in question, *against* the scientific consensus?

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Part of the answer lies in a misunderstanding of how scientific knowledge works:

> Doubt is crucial to science [...] but also makes Science vulnerable to misrepresentation, because it is easy to take uncertainties out of context and create the impression that *everything* is unresolved. This was the tobacco industry's key insight: that you could use *normal* scientific uncertainty to undermine the status of normal scientific knowledge. "Doubt is our product", ran the infamous memo written by one tobacco industry executive in 1969 […] (ORESKES; CONWAY, 2010, p. 34, our translation).

Here we find our starting point again: the author of the lines quoted at the beginning of the article intends to be on the side of science and rationality because she promotes doubt and, therefore, is on the side of science. As Oreskes and Conway (2010) say, this strategy shows a misinterpretation of science. But what's wrong?

Separating science and pseudoscience

Part of the answer is on understanding why denialism about global warming or vaccines is not science. Answering this question is less simple than it seems at first sight. There is no single model for theories that are on the margins of science, as shown by Gordin (2021). The spectrum of marginal sciences ranges from what Gordin (2021) calls "vestigial sciences", such as astrology and alchemy, disciplines that were once respectable sciences but no longer are, to "hyperpoliticized" sciences, as is the case, in a paradigmatic way, of Lysenko's biology, whose acceptance was determined by Stalin at a congress of the Communist Party in 1948.

The anti-vaccination movement or denialism about global warming are examples of pseudoscience. But why exactly? The strategy of doubt can enlighten us on this point. According to some deniers, the perception of global warming is due to the increase in urban areas, where the temperature is higher – an effect known as the Urban Island Effect – and where, the argument goes, many temperature measurements are taken.

This thesis is, at the outset, implausible given the multiplicity of effects associated with global warming, such as rising sea levels, particularly affecting island nations, or changes in tundra vegetation, phenomena that do not occur in urban areas. However, this explanation was proposed by two scientists, Ross McKitrick and Patrick Michaels, and has been refuted (SKEPTICAL SCIENCE, 2015). The authors of the study in question belong to the *Fraser Institute* and the *Cato Institute*, conservative and libertarian institutions funded, among others, by the Koch brothers and by *ExxonMobil* (ORESKES; CONWAY, 2010).

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This type of approach is the very form of pseudoscience: it is presented in the form of a scientific article, by scientists who know how to mimic scientific production, but who are not specialists in the area and do not follow an epistemic motivation. A disproved scientific hypothesis must be abandoned, in particular when it is hardly plausible in light of other accepted theses. However, this explanation remains available to those who want to defend a particular political position. In fact, Ernesto Araújo (again!) used precisely this argument in favor of policies based on denialism (RIBEIRO, 2019). This is a clear example of the political motivation of denialism towards AGW.

Gordin (2021) thinks that 'pseudoscience' is not a good label: without a clear demarcation criterion between what is and what is not science, this category loses its content, he says, and there are good reasons to doubt the existence of such a criterion. In fact, it is not certain that there is a solution to the so-called "problem of demarcation", that is, a criterion for separating science and non-science, especially if a single criterion is required, as intended Karl Popper, in particular. However, going from the absence of a single, clear and distinct criterion for a distinction to the non-existence of this distinction is not a good argument. Furthermore, one motivation, if not the central motivation for abandoning the Popperian project of demarcation is the methodological diversity of the sciences (DUPRÉ, 2008), not the thesis that all theories are equivalent, and even less the acceptance of different forms of scientific denialism. The methodological plurality is illustrated in a debate that is directly related to our theme: Coady and Corry (2013) show how, according to Popperian criteria, climatology is not a science. This is one reason to doubt Popper's approach, not climatology.

Once the search for a single criterion of demarcation is abandoned, the distinction between science and scientific denialism becomes more difficult. There is an indirect answer to this problem when we ask ourselves why we should trust the sciences. According to Oreskes (2019b), we should trust the sciences because they are social practices dedicated to knowledge of the world that involve self-correction mechanisms. From this answer, it can be argued that pseudosciences are not dedicated to the knowledge of the world and do not have self-correction mechanisms, as we saw in the example above: a discourse produced for political or economic purposes – the defense of the interests of the oil industry and, more generally, of an entirely deregulated market – which does not correct itself in the light of contrary evidence (ORESKES; CONWAY, 2010).

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We return here to questions upon questions: When should a theory correct itself? What kind of challenge should it seek to answer? These questions suggest another approach to the problem from a lead in discussions of skepticism in epistemology.

A detour through skepticism

The term 'skepticism' can be used in different ways. In philosophy, in general, this expression designates very general arguments that challenge what, at first sight, seems to be well established. This is the case with skepticism about the existence of the external world, the existence of other minds etc. In general, the skeptical position is not accompanied by an alternative theory, even if it can recommend an attitude towards these theses. The central point of this type of discussion is the elucidation of the nature of human knowledge. Let's call this kind of skepticism 'philosophical skepticism'.

There is another type of use of the term 'skepticism', generally outside the philosophical domain, which we can recognize, for example, in headlines such as "Covid-19 Mortality May Rise on Vaccine Skepticism" (BLOOMBERG, 2021, n.p.). In this case, skepticism simply designates the rejection of a given theory, for good or bad reasons, and can be associated with a positive theory on the subject in question. Indeed, the expression 'skepticism' can even be associated with the promotion of scientific theories as opposed to paranormal or mystical explanations. This is the motivation of the Skeptics society, whose objectives are described as follows:

> *THE SKEPTICS SOCIETY* is a nonprofit 501(c)(3) scientific and educational organization whose mission is to engage leading experts in investigating the paranormal, fringe science, pseudoscience, and extraordinary claims of all kinds, promote critical thinking, and serve as an educational tool for those seeking a sound scientific viewpoint (SKPETICS, 2022, n.p., our translation).

This usage reflects the local rejection of a set of theses and does not have a general scope. We shall call this use of the term 'ordinary skepticism'.

The third type of occurrence of the expression 'skepticism' refers to the perception that our knowledge is fallible. While reflecting ordinary usage patterns, this usage has some repercussions in the philosophical literature. Thus, a book entitled Philosophy from a Skeptical Perspective (AGASSI; MEIDAN, 2008) argues against the search for an infallible source of knowledge. If this is certainly a good recommendation, it is not a question of a refusal of

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knowledge in general (as in philosophical skepticism), nor of any precise thesis (as in ordinary skepticism).

The recommendation that science should involve some dose of skepticism designates its willingness to revise its own theses. This type of use of the expression has a different motivation than that which drives skeptical problems of the first type – it is not the elucidation of the general nature of our knowledge, but the willingness to correct accepted theses when good reasons present themselves. We see the difference between the first and third sense of 'skepticism' in an observation by Putnam (2004, p. 16, our translation): “one of the most difficult things to do in philosophy is to find a way to uphold the truth in fallibilism without giving up the game to skepticism”.

Fallibilism is reflected in the self-correction mechanisms of science, as we can see in the reports of the Intergovernmental Panel on Climate Change (IPCC, 2022): from the usual mechanisms of peer review to the explanation of the level of confidence in each specific thesis, our main source of knowledge about AGW embodies what might be expected of the self-correcting ability of science.

At first glance, when discussing global warming, we are left with only the second sense of 'skepticism', which, on a topic so well established by the sciences, is nothing more than a form of denialism. There is, however, another connection between the discussion of philosophical skepticism and what Oreskes and Conway (2010) call the 'doubt strategy'.

Two families of arguments against philosophical skepticism argue against the legitimacy of skeptical doubt. A first strategy of this type was suggested, among others, by Austin (1979): doubt itself has an epistemic cost, raising a doubt requires a “concrete” reason. Brandom (1994) explains this point as follows: “One of the lessons we have learned from thinking about hyperbolic Cartesian doubt is that doubts too sometimes need to be justified in order to have the standing to impugn entitlement to doxastic commitments” (BRANDOM, 1994, p. 177, our translation).

Another type of argument will say that some propositions constitute the foundation for all linguistic practice and cannot be put in doubt without this practice itself losing its meaning. This is Wittgenstein's thesis in On Certainty: some propositions, called “hinge propositions”, are neither subject to doubt nor require justification. Such propositions are at the base of the practices that constitute the game of giving and receiving reasons. Even if we can imagine contexts in which certain hinge propositions can be called into question (WITTGENSTEIN, 2012, prop. 63), every practice has a starting point in something that is taken as fixed: “That is:

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at a certain point I have to start not doubting; and that is not, so to speak, hasty yet excusable: it is part of the act of judging" (WITTGENSTEIN, 2012, prop. 150, our translation).[2]

Propositions like 'the earth has existed for more than five minutes' or 'I am a human being' constitute the common ground of our thoughts, which do not lack foundation in themselves.

There is a kind of skeptical response that can be applied to these two types of strategy: skeptical doubt is legitimate when we adopt an "objective or neutral" position, as proposed by Stroud (1984), philosophical contexts not only make very general questions about our knowledge, as they demand the justification of theses that, in the context of local practices, are taken for granted.

At first glance, this debate has little to teach us here: the doubts raised by the oil industry, whether about the reality of global warming or about its origin in human activity, are not general, but local and, following the dialectic of this debate, should justify their relevance with also local reasons. They do not, however, present a "concrete reason" for the doubt – this is the case, for example, of the doubt about the AGW raised by the Urban Island Effect, which does not have the necessary force to "challenge the right to doxastic commitments" that follow from what is established by the sciences (SKEPTICAL SCIENCE, 2015, n.p., our translation).

Both those who think to find an answer to skepticism and defenders of the legitimacy of skeptical doubt can agree that, in this case, there is nothing to be saved. Denial doubts are not legitimate: they do not present relevant alternatives that should be excluded, nor are they found in a theoretical context that (perhaps) makes general doubts pertinent. Precisely here we find a sensitive point for denialist epistemology: what is a legitimate doubt?

Doubtful doubts

Denialisms and pseudosciences come in different flavors, from the oil industry's denial of AGW, creationism with its thinly disguised pseudoscientific counterpart, Intelligent Design theory, which has institutions dedicated to its promotion, to bizarre forms like flat earth beliefs and the theory of chemtrails, which emerge in a less centralized manner and which, *prima facie*, are not associated with specific political or economic interests.

[2] "D. h. ich muss irgendwo mit dem Nicht-zweifeln anfangen; und das ist nicht, so zu sagen, vorschnell aber verzeihlich, sondern es gehört zum Urteilen.", trad. M. E. Costa.

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Despite their great diversity, denialisms and other related movements do not meet with skeptical doubts: there do not seem to be movements dedicated to denying the existence of the external world or denying the existence of the past. Well, perhaps there are coincidences between philosophical hypotheses and some conspiracy theories – zombies are a possible example of crossover – but my aim is not to map the extensive human doxastic bestiary, nor to suggest that there is a watertight separation between the two types of cases. However, there remain important differences between denialism and skepticism.

Skeptical doubts concern very general theses: does the external world exist? Are there other minds? Was the earth created five minutes ago? They are intended to reveal general features of our knowledge, are not associated with specific suspicions and do not lead to an alternative explanation of the same phenomena. Their relevance stems from a purely theoretical attitude and they can perfectly live isolated from practical life (SMITH, 2004). If the space of doubt for these cases depends on a theoretical attitude, it certainly does not extend to the cases above: denialism about AGW and flat earth beliefs do not aim to elucidate the way in which our cognition works, they do not suggest the suspension of judgment and, above all, at least in the first case, do not seek to isolate themselves from the consequences in practical life.

At first sight, we are simply facing another phenomenon. However, in On Certainty, Wittgenstein alludes to the shape of the earth as a kind of proposition that we do not call into question: "The picture of the Earth as a ball is a good picture, proven everywhere, and also a simple picture – in short , we use it without doubting it" (WITTGENSTEIN, 2012, prop. 147, our translation; see also prop. 291).[3]

If indeed this image is part of what everyone takes to be true – or at least Wittgenstein assumes this to be the case – it does not enter common ground in the same way as propositions like 'the Earth has existed for more than five minutes' or 'I'm a human being'. This distinction is explained in paragraph 138:

> There are, for example, historical investigations and investigations concerning the shape and also the age of the Earth, but not whether the Earth has existed for the last hundred years. Evidently many of us were told about this period by our parents and grandparents; but may not these be mistaken? "Absurd", you will say, "How could all these people be wrong?" But is that an argument? Isn't it just the rejection of an idea? And perhaps the determination of a concept? Because if I speak of a possibility here, it implies changing the role

[3] "Das Bild der Erde als Kugel ist ein *gutes* Bild, es bewährt sich überall, es ist auch ein einfaches Bild, - kurz, wir arbeiten damit ohne es anzuzweifeln." Trad. M. E. Costa.

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> of "error" and "truth" in our lives (WITTGENSTEIN, 2012, prop. 138, our translation)[4].

The (round) shape of the Earth is something that we do not put in doubt, but it is, at the same time, a thesis that results from investigations. How can this be the case? Because the proposition that the Earth is round enters the common ground due to the cumulative nature of the construction of knowledge: this thesis was established by specialists and, unless other specialists put it in doubt, it must be taken as true. It is not part of the general framework within which our activity of asking and giving reasons makes sense, its negation does not affect such fundamental concepts as error and truth. But it is very stable and its refusal touches on a crucial point of human knowledge: its social production.

At this point I will make a brief historical digression. In the twelfth century, the great Andalusian philosopher Averróis (2005) wrote a fundamental book, Decisive Treatise, arguing that Muslims, or at least those qualified for the study, had a duty to receive knowledge from any source, whether Islamic or not. One reason for this is that, when studying any subject, the scholar must base himself on what has gone before him, as no one can reach the truth alone:

> It is also evident that our goal, the knowledge of existing beings, will not be attained, unless in this study successive steps are followed and the previous investigator leans on his predecessor, analogously to what happens in the mathematical sciences. Suppose, for example, that until our time there was no science of geometry or astronomy, and that a single man, by himself, claims to know the dimensions of celestial bodies and their shapes, as well as the distances that separate them from one another; he would be incapable of it (AVERRÓIS, 2005, p. 13, our translation).

We can return here to the statement by Melanie Philipps (2017) according to which there is an attack on Western reason, that is, on science. It is not easy to know what counts as the Western reason in this story, if it makes any sense at all[5]. However, if there is an attack on science today, it is based on the refusal of knowledge constructed by specialists – here, the defense of science is found, of course, in the argument of Averróis (2005). Phillips is at the same time an example of historical ignorance and a symptom of socially constructed common ground refusal.

[4] "Es git, z. B., historische Untersuchungen, und Untersuchungen über die Gestalt, und auch (über) das Alter der Erder, aber nicht darüber, ob die Erde in den letzten 100 Jahren existiert habe. Freilich, viele von uns hören Berichte, haben Nachricht über diesen Zeitraum von ihren Eltern und Großeltern; aber können sich die nicht irren? – "Unsinn" wird man sagen, "Wie sollen sich denn alle diese Menschen irren!" Aber ist das ein Argument? Ist es nicht einfach die Zurückweisung einer Idee? Und etwa eine Begriffsbestimmung? Denn rede ich hier von einem möglichen Irrtum, so ändert das die Rolle, die "Irrtum" und "Wahrheit" in unserm Leben spielen.", trad. M. E. Costa.

[5] For more see Appiah (2018, p. 187-211).

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This distinction explains why there are flat-Earthers, but not five-minute people (people who believe that the Earth was created five minutes ago): that the Earth is round is established by some members of society, that is, it results from the social division of cognitive labor. The legitimacy or not of doubt about the shape of the Earth, or AGW, or vaccination depends on accepting the asymmetrical distribution of knowledge. There are no experts who establish that the Earth exists for more than five minutes, or that the external world exists. What is at stake in denialisms is the refusal of the division of cognitive labor, not the elucidation of the nature of knowledge.

Denialist arguments reject science by rejecting specialist knowledge. Bolsonarist Damares Alves regretted that science was left to scientists and that the theory of evolution entered schools, which is the same thing as regretting that students acquire knowledge (HOLANDA, 2019). The president of the Texas State Board of Education in 2009, Republican Don McLeroy, declared in a meeting: “Someone needs to stand up to the experts!”:

> The [Texas State Board of Education] board of directors spent a good deal of time debating not only against the Theory of Evolution, as usual, but also on another topic that is agreed upon by scientists based on evidence: the reality of global warming. McLeroy even told a reporter, “Conservatives like myself believe that evidence is a bunch of bullshit.” (WORTH, 1998, p. 55, our translation).

If creationism and denialism about AGW reflect clearly identified interests – respectively, an identity interest and an economic interest –, there is another dynamic that appears in flat earth beliefs.

“Mad” Mike Hughes launched himself in a rocket to prove that the earth is flat, an attempt that ended up resulting in his death (BBC, 2020). Perhaps surprisingly, his flat-Earther faith was not so certain: he seemed willing simply to test the hypothesis ("If the earth is a globe, I'll tell you it is a globe!") and, according to a friend, he was more a fan of conspiracy theories than of flat earther (LAMOUREUX, 2020). It is not certain that this consideration improves his posthumous epistemic reputation, but it throws another light on this type of theory: no matter what his true beliefs were, he rejected official knowledge. Denial of expert knowledge is effective even when there is no independent interest at stake. Doubt plays a central role in this dynamic.

The debate about philosophical skepticism showed us that the legitimacy of doubt cannot be taken for granted, for at least two types of argument: the epistemic cost of raising a relevant alternative and the stability of propositions that constitute the framework in relation to

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which our thinking makes sense. Here we see another configuration of the space of doubt. As the production of knowledge demands knowledge of specialists, only specialists can question theses that demand specialized knowledge.

Expert knowledge can extend beyond the sciences, in particular to forms of traditional knowledge such as traditional agricultural practices. Mao Zedong refused traditional Chinese knowledge: sowing should be closer than what Chinese farmers have done for millennia, because those of the same class do not compete with each other. The hunger resulting from this refusal of traditional knowledge killed more than 40 million peasants (MERCIER, 2020).

Our knowledge today is mainly scientific – which includes explaining why traditional knowledge works. In any case, for the issues in question (AGW, the shape of the Earth, the effectiveness of vaccination) knowledge is exclusively scientific. There is a social filter of doubts judged relevant or not by the community of specialists, whose paradigmatic mechanism is the peer review.

Given the cumulative character of knowledge, an aspect of the cumulative character of human culture, once a thesis is established in a community of experts, it is treated as true by that community of experts and, deferentially, by those who do not belong to this community. For different reasons, but which end up converging, flat-Earthers and AGW deniers refuse to accept that only specialists can question established theses in a given area. As this is the condition for the legitimacy of doubt for knowledge constructed asymmetrically, your doubt is not legitimate. Propositions like 'the Earth is round' or 'the Earth is 4.6 billion years old' do not play a central role in our judgmental practices – they are not “hinge propositions” – however, doubts by laypeople about such propositions are illegitimate because reveal a break in the asymmetrical social distribution of knowledge, which is also central to human cultures.

But how to justify this normative conclusion? How to remove the legitimacy of doubt from a factual consideration of the social character of knowledge production? The question can be put another way: what kind of normativity makes the doubt of the denialists about the AGW, or of the flat-Earthers about the shape of the Earth, illegitimate?

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Two types of normativity

To paraphrase Putnam's phrase (2004), one of the most difficult things in philosophy is to accept that theories are social constructions without falling into the elimination of epistemic normativity. It is clear that theories are social constructs and, for this reason, they are subject to the forces that shape social facts: prejudices, political and economic interests, but also social mechanisms of self-correction and institutional stabilization.

The fact that theories are social constructs does not imply that they do not speak about the world, that they are not about something, it does not eliminate their intentionality. This is what authors who associate the social construction of scientific theories with the social construction of the facts about which the sciences deal do not seem to see this.

In a famous article, Latour (2000) stated that Ramses II did not die of tuberculosis, an explanation proposed by scientists in 1976. A longer quotation of the way in which Latour presents his thesis is worth mentioning here:

> Let us accept the diagnosis oi "our brave scientists" at face value and take it as a proved fact that Ramses died of tuberculosis. How could he have died of a bacillus discovered in 1882 and of a disease whose etiology, in its modern form, dates only from 1819 in Laênnec's ward? Is it not anachronistic? The attribution of tuberculosis and Koch's bacillus to Ramses II should strike us as an anachronism of the same caliber as if we had diagnosed his death as having been caused by a Marxist upheaval, or a machine gun, or a Wall Street crash. […] Koch bacilli have a local history that limits them to Berlin at the turn of the century. They may be allowed to spread to all the years that come *after* 1882 provided Koch's clairn is accepted as a fact and incorporated later into routine practices, but certainly they cannot jump back to the years *before* (LATOUR, 2000, p. 248-249, our translation).

In a later text that is a kind of retraction to this type of statement, Latour (2004, p. 227) states that he only intended to "emancipate the public from prematurely naturalized objectified facts". Whatever the plausibility of the thesis exposed in 2000 (which, in my eyes, is null), it is clear that it is not a precaution of a prematurely accepted fact, of something not yet established and that is taken for granted. Latour thought he had found a categorical argument: tuberculosis is a cultural creation in the same way as the stock exchange or a Marxist guerrilla. He finds himself in the same position in 2004.

Indeed, in this initial position review article, he seeks to recognize the pressure that facts exert on theory building. Those who defend social constructivism have stressed the extent to which the object of theory is a projection of the theorist's wishes, says Latour. It is now a question of highlighting the fact pole. However, at the fact pole, we only find pressures that are

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exerted on the agent, such as the economic infrastructure, the class, race or gender of the theorist or even the results of evolutionary psychology (LATOUR, 2004). What is extraordinary about this fact pole is that there is no pressure exerted by what the theory is about, as if it had no intentionality. The facts are just facts about the agents, not about what the theory is about, for example, Koch's bacillus.

Let's consider an example cited by Latour (2004), the shift in perspective on primate behavior that resulted from the work of female scientists. They showed facts *about* primates, such as the determination of foraging strategies by females in groups of baboons and the role of females in sexual choice (SPERLING, 2007). This is precisely an example of how a greater diversity of scientists increases the *objectivity* of theory, as Oreskes (2019b) shows, by increasing points of view on a given phenomenon. However, this answer is not available to Latour (2004), since, for him, the fact pole comprises only facts about the scientists themselves (gender, race, economic structures, etc.)

Why is this important? Because the epistemic legitimacy of a question concerns its sensitivity to world state indicators – in this example, the behavior of baboons. If the factual pole concerns the agent's behavior, as Latour (2004) says, there are no more or less legitimate questions, or rather the legitimacy of the questions will concern only a power game.

This is exactly what Fuller (2018) says: truth is just a power game and any limitation of issues as more or less legitimate is the result of a power game. One consequence, of course, is that denialism about AGW is legitimate – it is just a political issue. Latour, says Fuller (2018), retreated from this consequence of his theory, namely, the openness to scientific denialism in relation to AGW, for political reasons, not for theoretical reasons. This is a more general pattern: Hansson (2020) shows how advocates of the so-called strong program of the sociology of scientific knowledge changed their position in relation to AGW, from denialism to criticism of denialism, when this theme became a right-wing banner.

Let's return to the consequences of the debate about skepticism: denialist doubts are illegitimate because they do not present evidence capable of leading to a revision of the proposed position, they do not present epistemic reasons. This is the normative basis from which denialism about AGW, the doubts raised by flat-Earthers about the shape of the Earth or by Intelligent Design theorists about evolution are illegitimate. For those who think that there are no epistemic reasons, but only reasons of power, or who think that the fact pole only contains determinants of the theorist's action, and not facts on which the theory rests, this type of normativity is an illusion and all doubt is legitimate. We also see here why the restriction of

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theoretical doubt (of creationists, of flat earthers, of the anti-vaccination movement) can seem undemocratic: because the epistemic normativity is entirely absorbed by the normativity of power and the problem can then be posed as a political problem.

The usual debate around skepticism considers that there is a properly epistemic normativity. Denialism and its advocates deny the legitimacy of epistemic normativity, whether they know it or not. It is clear that, at this point, consideration of the social dimension of knowledge is crucial. But if this consideration comes at the cost of abandoning epistemic normativity, there is nothing to argue about. The most difficult thing is to accept that theories are social constructions without falling into the elimination of epistemic normativity.

Final considerations

Doubt plays a central role in denialist arguments: refusing the legitimacy of doubt about AGW, the effectiveness of vaccination, the theory of evolution, or the shape of the Earth by non-experts is simultaneously anti-democratic and anti-scientific. However, doubt in science is cumulative, that is, it starts from a point where much of the accumulated knowledge is taken for granted. This specificity of epistemic normativity is not transmitted to other normative dimensions, such as the political dimension. This is the central conclusion of the article.

In addition to the functioning of doubts, there is another important element in the argument. Theories are social constructs, they do not grow on trees or hatch from eggs. This does not imply that the objects of theories are themselves social constructs. The confusion between these two aspects – that the theory is a social construct that deals (or can deal) with objects that are not themselves social constructs – helps to mask the functioning of the epistemic normativity, which provides the key to the evaluation of the legitimacy of different types of doubt.

The discussion about the legitimacy of doubts is in a space made of tenuous lines. The conclusion of this article is that the space of legitimate doubts is the one delimited by what is accepted as an adequate argument by specialists in the field. This conclusion appears to have inconvenient results. Initially, it seems to leave no room for doubt in the sciences. However, the social mechanisms of academic selection recognize legitimate discussions, even in the face of profound disagreements. In addition, it is quite possible that outsiders bring new insights to different types of scientific discussion, which, moreover, may be precisely due to their marginal position. Finally, social mechanisms of epistemic selection also reflect oppression and power

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relations, which can (and do) result in failure of filtering mechanisms. This has been the theme, for example, of feminist epistemology for some decades now. However, in all these cases, the arguments are epistemic in nature. This is the case of feminist epistemology: far from detaching theory building from epistemic reasons, feminist epistemology suggests that "objectivity could be reenvisaged as a social *accomplishment*" (ORESKES, 2019b, p. 50, our translation), by increasing points of view on a set of phenomena.

It is always possible for a flat-Earther, or an AGW denier, to pretend to present epistemic arguments. There is no general answer as to when this is the case and when it is not. But once we look at the dynamics of these cases, in particular the refusal of the work of specialists and the usual mechanisms of epistemic filtering, we see that we are facing another type of phenomenon.

Here, we find another delicate space in which the proposed conclusion moves: is not following what experts say a way of limiting freedom? Does not the Enlightenment suggest, on the contrary, that everyone thinks for himself? There is not space here to respond to this type of criticism. I will confine myself to two considerations. The first is that human knowledge has always been produced in a cumulative, collaborative and asymmetrical manner. If this demand means that we must think like Robinson Crusoe, it is a demand that is not part of human culture – the cumulative, social and asymmetrical production of knowledge is a profound feature of the evolution of human culture (CSIBRA; GERGELY, 2011; TENNIE; CALL; TOMASELLO, 2009).

In addition, we must be aware of different types of reason and different types of normativity. Just as the association of epistemic normativity with political demands is not justified, based on the association of truth with an effect of power, the opposite movement is not justified either: in the distribution of power in a society and in the expression of desires and needs, the asymmetry epistemically motivated disappears and we have every reason to demand that all voices be heard. Epistemic asymmetry does not provide an argument for political asymmetry.

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