

# CONSTRUCTIVE EMPIRICISM WITHOUT THE EPISTEMIC COMMUNITY

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**Abstract.** *Constructive empiricism (CE), a widely debated anti-realist philosophy of science by Bas van Fraassen, offers a philosophical interpretation of scientific practice. The agent of the scientific practice, according to CE, is what Bas van Fraassen himself calls the “epistemic community”. However, William Seager argued that by appealing to the epistemic community constructive empiricists warrant scientists’ belief in unobservables. Moreover, Simone Bahrenberg et al. maintained that if what is observable is defined in terms of whom a particular epistemic community consists of, then observability cannot be an objective property, while CE needs observability to be objective.*

*In this paper, based on four thought experiments, I consider a special hypothetical case of the epistemic community consisting of only one person and notice that in this hypothetical case the objections by Seager and Bahrenberg et al. dissolve: Seager’s requirement to treat the reports of other members of epistemic community as an evidence for the epistemic belief collapses; and, contra Bahrenberg et al., observability for a single person is unproblematically objective in CE. Based on this observation I argue that constructive empiricists would be better off reformulating their main thesis in terms of a single cognitive agent (person, scientist), because (i) this would not only allow CE to render all the objections appealing to the concept of epistemic community ineffectual once and for all, but also (ii) using the proposed modification constructive empiricists could straightforwardly account for some cases of possible scientific practice, for which their original thesis cannot account in an obvious manner. The above change in the policy of CE (iii) would still allow to retain the key features of the empiricist position—the observable/unobservable distinction, the distinction between acceptance and belief, the principles of epistemic modesty and the principle of scientific rationality—at least on an equal footing to the original thesis by van Fraassen.*

**Keywords:** *constructive empiricism, epistemic community, observability, objectivity*

Constructive empiricism (CE) is probably one of the most debated antirealist conceptions of science. The main idea of CE, as expressed by Bas van Fraassen in his seminal work *Scientific Image* (1980a), is that science seeks not true but rather empirically adequate theories.

Van Fraassen is straightforward in answering the question of who or what the

agent of the scientific practice is: according to CE, looking at our science, it is obviously our “epistemic community” or just us as a group of scientists. One of the many issues surrounding CE, as an influential empiricist alternative to the realist approach to science, is the question whether CE correctly bases its philosophy on the concept of epistemic community.

Besides the general puzzlement about how we can ascribe the epistemic belief to a society of scientists without getting into sociological debates (Rosen 1994, van Fraassen 1994, Mizrahi 2014), and despite van Fraassen's effort to define the epistemic community, to describe its change, and to draw its boundaries (van Fraassen 1980a, 2006), there are at least two direct arguments against the attempt to treat the "epistemic community" as a basis for the CE view on science.

William Seager (1988) argued that by appealing to the epistemic community CE warrants scientists' belief in unobservables, because if the epistemic community is really "epistemic", ideally every member of it should believe what every other member believes, even though in principle the perceptual capabilities of different members of the same epistemic community can be different to the extreme.

Bahrenberg et al. (2006) maintained that if what is observable is defined in terms of whom particular epistemic community consists of, which in turn depends on non-scientific criteria like moral choice, ideology, etc., then observability cannot be an objective property, while CE claims observability to be objective.

In this paper using four thought experiments I consider a special hypothetical case of the epistemic community consisting of only one person (human or non-human). One can immediately notice that in this hypothetical case the objections raised by Seager and Bahrenberg et al. simply do not work. If we agree that a single person can conduct epistemically full-fledged scientific activity, Seager's requirement to treat the reports of other members of the epistemic community as an evidence for the epis-

temic belief seems unavailing. Also, *contra* Bahrenberg et al., in the case of a single person the observability (for that person) is unproblematically objective in CE, because what a single person observes is just a function of how she as a sort of measuring apparatus interacts with the outside world, and not a function of the problematic moral and ideological criteria.

Based on the above I, furthermore, suggest that constructive empiricists would be better off reformulating their main thesis in terms of a single cognitive agent (person, scientist, or anyone capable of acting and creating what we would consider to be the features of science as an epistemic activity) instead of the whole epistemic community. First of all, this would allow CE to rebuke all the objections appealing to the concept of epistemic community, because if CE interpreted the essentially epistemic nature of the endeavour of knowing the observable phenomena without the concept of epistemic community (the *community* being epistemically contingent or pragmatic feature of science), there just would be nothing to attack. Secondly, using the proposed modification CE can straightforwardly account for some cases of possible scientific practice (for example, for those described in this paper), for which its original thesis cannot account in an obvious manner.

Third, I will argue that the proposed change in the policy of CE still allows constructive empiricists to retain the key features of their philosophy and to hold CE ground in other well known CE debates, at least as well as using the original CE thesis. Here I take the most salient features of the CE philosophy to be the observable/unobservable distinction, the distinction between the pragmatic acceptance and the

epistemic belief, the principle of epistemic (or “ontological”) modesty and the commitment to make sense of science as a practical rational activity.

## A Lonely Scientist Thought Experiment

Imagine a post-apocalyptic world in which all human-beings had been wiped out from the face of Earth with the exception of a single person, Jane Doe, a capable yet evil nuclear physicist, who happened to know about the upcoming global disaster (not that she had anything to do with it) but failed to inform about it her beloved ones<sup>1</sup> (not that she had many), let alone anyone else in the doomed world.

There is not much to do in an empty planet, so Jane Doe continues doing what she likes and knows best, namely, science. As World Wide Web is still working, she has access to all the automated experimental facilities, including the Large Hadron Collider (LHC), gravitational-waves observatories, neutrino detectors, plethora of space and ground telescopes, etc. Also, she possesses superior mathematical skills to construct new theories and to test them using the aforementioned scientific instrumentation. Jane Doe’s scientific activity might last not for too long, as the scientific infrastructure is subject to wear and tear. This, however, need not to be of big concern for the philosophers of science who might decide to describe (or to *interpret*) Jane Doe’s scientific practice at that particular period in the human history.

Now suppose typical constructive empiricists decide to do just that and after con-

sidering the life of Jane Doe for a while they describe what Jane Doe is doing, or rather what the purpose of Jane Doe’s activity is, in the usual manner as per famous thesis (let’s call it *OCE* - the *original CE*) by Bas van Fraassen:

*Science aims to give us theories which are empirically adequate; and acceptance of a theory involves as a belief only that it is empirically adequate.* (van Fraassen 1980a: 12)

Note that, if constructive empiricists are able to interpret science in terms of the above thesis in the case of scientific community which consists of millions of people, they should be able to do so in the case of single Jane Doe as well. After all, Jane’s science is not so much different from the science as we know it. The former is just slower and less diverse, but constructive empiricists would be reluctant to admit that their thesis is about financial and human resources in science rather than an interpretation of the most salient (if not *essential*) features of the epistemic activity they happen to admire so much (van Fraassen 1994: 191).

Moreover, when describing Jane Doe’s activity, constructive empiricists have no business in trying to define epistemic community and draw its boundaries as van Fraassen himself had taken pains to do on at least a couple of occasions (van Fraassen 1980a: 18; 2006: 128-130). After all, in this case the epistemic community is just the lucky Jane Doe. Unsurprisingly, some critical arguments against CE, appealing to the concept of epistemic community, just dissolve in the case of Jane Doe, because in this case an epistemic community or a set of scientists is just equivalent to a single scientist.

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<sup>1</sup> Some say she was the little sister of Mary, the color scientist (see Jackson 1982).

For example, based on the CE claim that science could be interpreted as if scientists did not believe in what their accepted theories told us about the unobservable part of the world, William Seager argued that the belief in unobservables, on the contrary, is warranted by the principle “believe now what you would believe if you accepted as evidence what is unavailable only by accident” (Seager 1988: 186), where the evidence for the scientist’s beliefs, among other things, includes the stated beliefs of other members of the epistemic community. According to Seager, in an ideal case, if a member  $X$  of some epistemic community believes that another member  $Y$  of the same scientific community believes some proposition  $P$ , then  $X$  also believes  $P$  (Seager 1988: 183 eq. P2). Let’s call this principle the *epistemic reliance principle*. As a lot of possible sentient beings (like intelligent robots or Martians) of advanced sensory capabilities are the potential members of our scientific community and their beliefs are potentially epistemically relevant, in principle everything is observable, and there can be no significant distinction between van Fraassen’s CE thesis and his formulation of scientific realism (van Fraassen 1980a: 8).

Seager’s epistemic reliance principle, on its own, seems to be extremely strong. One might argue that, even in an ideal case, something like a weak principle of reliance (and not Seager’s principle) is at work in science. For example, if a member  $X$  of some epistemic community believes that another member  $Y$  of the same epistemic community believes some proposition  $P$ , then  $X$  might not immediately believe  $P$ , but rather might believe that it is worthy (on pragmatic and not epistemic grounds) to form belief in  $P$  or come to disbelief in

$P$ , or just to seek evidence for  $P$ . However, as long as CE includes the concept of epistemic community to its conception of science, Seager’s contention that the members of the epistemic community have to be epistemically significant to each other in some way has to be answered in detail.

Nothing of the clash between CE and Seager, however, is of concern in the case of the lonely Jane Doe. If we admit that a single person can go about doing epistemically full-fledged science, Seager’s epistemic reliance requirement for science collapses. Jane Doe’s epistemic activity can in principle be as successful as normal science despite her not believing that there are any intelligent beings left in the whole universe, and her not necessarily relying on anyone but herself. Thus no epistemic community (consisting of more than one sentient being) and, in turn, no epistemic reliance on any other sentient being is necessary for doing science.

Simone Bahrenberg et al. (2006) similarly based their critique of CE on van Fraassen’s willingness to discuss aspects of epistemic community:

the observability of a phenomenon depends on who is a member of the epistemic community and we have seen that membership in the epistemic community depends on moral and ideological criteria. [...] But whatever these criteria are, it seems doubtful that they are objective in the sense in which findings of the natural sciences are objective. (Bahrenberg et al. 2006: 40)

With this argument Bahrenberg et al. challenge the CE contention that empiricism can do both: (a) base its philosophy on the concept of epistemic community, and (b) maintain that observability is an objective property of things, states of affairs or fea-

tures of our world. In simple terms, the point of critique by Bahrenberg et al. is as follows: if we, based on our good will, accepted an artificially intelligent robot with the X-ray detection capability to our epistemic community, our concept of observability would all of a sudden refer to X-rays, which in general are treated as unobservables. Thus, X-rays are observable for the good-natured.

In a complicated answer, van Fraassen (2006), if I understand him correctly, contradicts that the argument of Bahrenberg et al. fails to distinguish between the matters of fact and how those matters of fact are described. The matters of fact are, in this case, how members of the scientific community interact with the outside world to be capable of perceiving it, and at any given time those are objective (factual), determined purely by the physical state of the world and the physical state of the creatures perceiving it.

While it is true that many additional considerations will be involved in describing those matters of fact, this still allows CE to claim that observability is indeed a physical property determined by the interactions of scientists, as a sort of measuring apparatus, with an outside world. We could even try to cash out the concept of observability in purely scientific terms (for an example of such an attempt see Muller 2005: 83). In CE the question of how sentient beings come to finally name some things observable and others unobservable is just a curiosity rather than a necessary part of the empiricist conception of science (van Fraassen 2006: 131-132). And any actual *process of naming* of different sorts of factual physical states of affairs in different sorts of communities would be of similar status for CE. What is important, however, is that we predicate observability based on how we physi-

cally interact with the world, regardless of whether there is just one scientist or many.

The latter complications in the debates the latter complications in the debates of CE are easily avoided in the case of Jane Doe. The lonely scientist does not have to share her concept of observability with any other being. Though we still might be struggling to give a perfect definition of what it is to be an objective property (for CE *objectivity* is an intra-scientific notion (van Fraassen 1980a: 82), and thus, one cannot easily reflect on the “essence” of objectivity by means of armchair philosophy), in the case of Jane Doe we at least can easily describe what we mean when we say that observability is objective. We mean exactly the same thing as when we say that Jane Doe is objectively seeing a particle accelerator, when she is in front of it. When there are no other actual or potential members of scientific community around (including those having no capability to observe the optical spectra), what Jane Doe is capable of observing depends just on her interactions with the world (not on the problematic ideological criteria), and those are unproblematically objective in CE.

### **Scrutinizing the Case of a Lonely Scientist**

The point of the above hypothetical case was to emphasize that as soon as empiricists shift their attention to a single scientist instead of the whole scientific community, the critical arguments based on the alleged over-reliance of CE on the concept of epistemic community collapse. Thus, instead of the original thesis by Bas van Fraassen (*OCE*), I suggest stating constructive empiricist philosophy of science along the following lines (let’s call this thesis *RCE* – the *reduced CE*):

[Scientist *qua* scientist aims – J. B.] *to give us theories which are empirically adequate; and acceptance of a theory involves as a belief only that it is empirically adequate.* (van Fraassen 1980a: 12)

The actual wording need not to be of a big concern here, the point being, that the CE thesis might be reinterpreted as saying that a sentient being or a person, or just anyone, abstractly speaking, is a scientist or is acting like a scientist as long as her activity may be understood and interpreted as seeking theories that are empirically adequate. This way we separate the philosophy of science and the question of *what science is* from other possible sociological and anthropological questions (arguably factual): what does it take for a group of scientists to work together, what differences they have to overcome and what fractures in their communities might occur when they start doing science together. On the surface of it, this change is minor, but by using it CE becomes immune to the critique based on the not so clear concept of epistemic community in the *OCE*.

There are two ways for the opponents of CE to try to maintain the original thesis thus keeping CE exposed to the arguments based on the concept of epistemic community. The first challenge is to focus on the *RCE* itself and to claim that the modified *RCE* has something seriously amiss. Namely, that the new CE fails to reflect on some essential features of science, because science is essentially (and epistemically) a collaborative effort. Or one could claim that the *RCE* is incoherent in the way the *OCE* is not. The second way to challenge the proposed modification of constructive empiricist policy is to claim that the modification changes the nature of CE thus expressing quite another

philosophical position, possibly susceptible to other kinds of criticism to which the original CE was not susceptible. First, I will defend the *RCE* against the first challenge, and I will address the second challenge in the next section.

As the first challenge I propose to consider two arguments against *RCE*.

**A.** Though at first sight the thought experiment of Jane Doe might seem compelling, thought experiments in general are quite a species of philosophical methodology on their own and are notorious for being susceptible to various flaws (Sorensen 1998: 21-50, 256-274). And the easiest way to claim that the description of science as a one-person activity makes no sense is to argue that the description of Jane Doe's possible world is not full: while it is true, that at the given moment Jane Doe is doing science on her own, but, abstractly speaking (both *OCE* and *RCE* should be interpreted as abstract<sup>2</sup> and even reconstructable by the means of formal logic (Muller 2004)), she is still a part of her vanished epistemic community and she still treats her activity as if she was communicating with other scientists. Thus, Jane Doe's science is the same science of the epistemic community as a whole. In order to answer this objection I propose three other more clear-cut cases of a single sentient being epistemic community.

Imagine a primitive human being who happened to be the first of his kind to start doing something which CE would be willing to call science. For example, he starts imagining unobservable forces of nature and using their supposed regularities to predict the periodic movement of heavenly

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<sup>2</sup> As opposed to chronological, for example.



bodies (those he constantly observes). Also, suppose this Cro-Magnon uses some primitive sign system to write down his findings. But just about the time this early *homo sapiens* starts investigating the unobservable nature of the observable four seasons, a giant asteroid, similar to the one which wiped out the dinosaurs, hits the Earth and this time kills off every human being including the primitive scientist. Are we supposed to treat this case as if nothing what we would like to interpret as primitive science ever happened, just because there had been only one scientist during the whole history of the humankind, and he tried to grasp the empirical phenomena of this world possibly just for his own personal sake disregarding the knowledge and utility of his fellow cave-men? I think not.

Opponents of RCE might still insist that the contemporary science is quite another thing than the scribbles of primitive Cro-Magnon, even if we could imagine the continuous development from the latter to the former, and CE is not committed to explain anthropological curiosities. In order not to get trapped in some version of continuum fallacy, I would like to use the common weapon of choice in the scientific realism-antirealism controversy and investigate the possible case of a single extraterrestrial scientist.

Imagine an intelligent giant creature with thousands of tentacles, living in the planet far far away, capable of manipulating its environment, create phenomena it is interested in, and able to systematize its knowledge using some form of sign system. This creature is the one and only scientist of its species. We could speculate, that its giant body constantly regenerates, thus it lost its (unnecessary) ability to breed and

for all we know it was, is, and will be the only member of its scientific community. There is nothing logically or nomologically impossible about such case.

Furthermore, let's investigate another possible case. Moritz Schlick once wrote about possible situations, where some person feels other person's pain (Schlick 1963: 485-487). In the spirit of Schlick's example, imagine another alien life-form which is somewhat similar to a big tree with multiple nerve centers on its branches and a couple of partially overlapping sensory organ complexes, which would mean that, for all constructive empiricists know, the different brains of this intelligent plant can feel the pain of other brains, can be directly aware of parts of its neighboring brains' sensory information, etc. Suppose, again, that we encounter this plant and observe that, being mobile, it repeatedly creates some phenomena and has something like a written language to register the results of its experiments. We could interpret its activity as some sort of alien science, because it is, exactly, a very complex scientist going about its research. Someone might object that different brains should be treated as separate scientists. Should this possible misunderstanding have any bearing on CE? No. Our philosophical reflection on science should not depend on the considerations of neuroscience and on the answers to the very tough questions from the books of philosophy of personal identity or philosophy of mind.

Note that here I am not trying to tell what exactly these possible creatures should do to be dubbed "scientists", which is obviously an interesting question in the philosophy of CE on its own as CE claims to be a successful interpretation of the scientific activity.

Rather, I insist that it is hard, if not impossible, to show that in principle single-scientist (whomever or whatever we choose to call it) science cannot exist. And if CE chooses to account for those cases, it should do so unambiguously with *RCE* and without raising the suspicion that community (Schlick's plant is almost definitely a scientist, but it is not clear at all whether we can call it a "community", which would seriously complicate matters for the *OCE*) plays an essential part in how CE epistemology (or axiology, to be precise) portrays science.

**B.** Another possible objection to the proposed modification of CE appeals not to our contingent and, as I was arguing, unjustified discrimination in favor of human-like conglomerates of scientists, but rather to the coherence of the *RCE*. Besides trying to grasp the scientific activity in terms of the aims of one scientist, *RCE* also appeals to the scientific theories that are usually analyzed as linguistic or mathematical-linguistic entities. One might argue that though a single sentient being is capable of some sort of cognitive activity and it is possible to formulate a philosophical position according to which this activity is science, this philosophical position is definitely not *OCE* nor *RCE*, because a single cognitive agent cannot aim for linguistic entities as nothing we could legitimately call language can, from the logical or nomological point of view, be ascribed to an agent without past or present community.

This objection is, however, misguided. Again we should distinguish between what we are trying to say about the language as the philosophers of science and what can be said about the language by the scholars of the other legitimate fields of research. In

our humanly world, language is a communication device, but again it seems not at all unreasonable to think that in the aforementioned hypothetical "communities" it can act as just a device of thought economy or, put bluntly, as a device for a single scientist to communicate with itself. Van Fraassen himself is quite strict about what questions the philosopher of science can ask about the scientific theory. At least in the analytical philosophy of science those are the questions about the structure and the content of the theory, also the questions about the relation between the theory and the data (van Fraassen 1980b: 664–665). And those questions definitely do not include anything about how and if theories have to be communicated among social beings.

One could suspect that here we are starting to talk about something like "private science" (analogous to the "private language"), but this would be a false analogy. I am talking rather about a sign system used by a single scientist to systematize his or her scientific findings, for example, about a language consisting purely of written mathematical formulae. This sign system, with sufficient effort, could in principle be deciphered even by other scientifically competent communities, while private language (if it is logically possible at all) would be a language in principle unintelligible to anyone else except its "native" speaker.

Going back to our Jane Doe, one might still be tempted to try to describe on what conditions this small single-person community might change. For example, on what conditions Jane Doe would accept into her epistemic community the artificially intelligent robot she had created. However, it is not clear why CE philosophers capable of interpreting the enterprise of being a



scientist *qua* scientist, based on their now modified thesis, would want to get into anthropological and social aspects of when and where scientists decide to coordinate their endeavor to investigate the empirical world. Why would CE want to claim that “*science is N sentient beings* (or just humans, if we decide to apply CE only to our scientific community) *working together*”, where *N* is supposed to be what number? The cooperation of Jane Doe and her robot is up to them and up to the anthropologist, but not up to the empiricist epistemology or axiology of science.

### **Appeal to the Epistemic Community is Unnecessary for Constructive Empiricism**

Admittedly, there are some direct indications in the work of Bas van Fraassen, that he would prefer to somehow include the concept of epistemic community to the philosophy of CE. For example, van Fraassen notes that science is a “cultural phenomenon” (van Fraassen 1980b: 663). His work as a whole, however, seems to indicate otherwise. In this section I argue that, besides immediately dissolving one of the headaches of CE (critical arguments based on the concept of epistemic community) and allowing CE to make sense of possible cases of scientific practice described in the thought experiments above, the shift from *OCE* to *RCE* is negligibly minor. I will argue that the main concepts and the main debates of CE are unaffected by the proposed modification in no relevant way. Thus, a change from *OCE* to *RCE* is indeed just a small change in wording yielding considerable results. I would like to emphasize that the purpose of this section

is not to defend CE against its critics, but just to check if the CE is invariant under the transformation from *OCE* to *RCE*.

I take the main tenets of CE to be as follows: (i) effort to interpret practical activities of scientists; (ii) claim that the science is *rational*; (iii) commitment to epistemic modesty (“ontological” economy); (iv) specific construal of the distinction between the observables and unobservables; (v) distinction between the pragmatic acceptance and epistemic belief.

I have already made considerations regarding (i), and concluded that if we agree that the single scientist science is possible, there is just no reason why CE should not account for that scientific practice. Constructive empiricists, looking at the science of some community, should be equally able (or unable) to interpret the activities of the parts of that community as well.

On multiple occasions van Fraassen suggested that his CE is intended as an interpretation of science as rational activity (van Fraassen 1980a: 19, 1984: 235, 2003: 180). It is usually taken for granted, that CE bases its philosophy on the so called voluntaristic conception of rationality (Okruhlik 2014, Dicken 2009a, 2010), largely due to van Fraassen’s epistemological-psychological conception of rational belief, according to which epistemic judgement might be rational even without sufficient evidence to warrant its certainty, because the epistemic judgement is “a matter of cognitive commitment, intention, *engagement*” (van Fraassen 1984: 256). The consequence of this conception for CE is that van Fraassen uses minimal criteria for scientists to be rational (thus minimal criteria for his thesis in this respect). As long as scientists are capable of acting on their set of beliefs in

committal, practical, intentional way, they can be treated as rational cognitive agents. This boils down to the principle that as long as scientists are coherent in their actions (they are capable of acting in a way that can be interpreted logically coherently), whatever judgment they are following in those actions can be evaluated as rational.

Whether this minimal requirement for scientific rationality is plausible is not at issue in this paper. The issue is: does the question of scientific rationality change in some important way under the transformation from *OCE* to *RCE*? I believe not, because whether the complex of one's beliefs is rational or not is usually discussed in terms of contents of beliefs and not in terms of the agent having these beliefs. Moreover, discussion between Gideon Rosen (1994) and van Fraassen (1994) about the interpretation of CE in general and about what it means for a group of people to have a *belief* in particular (Rosen 1994: 145-147) suggests that, in terms of the second (ii) aspect of CE we are considering here, *RCE* might be even preferable to *OCE*. Thus, the question of scientific rationality in CE is invariant under the transformation from *OCE* to *RCE*, and *RCE* may even be preferable.

What weight does the transformation from *OCE* to *RCE* have in debates of CE, regarding the epistemic or ontological commitments (iii)?

*First of all*, van Fraassen suggests that his thesis is a modest alternative to what he thinks would be a reasonable scientific realist thesis:

*Science aims to give us, in its theories, a literally true story of what the world is like; and acceptance of a scientific theory involves the belief that it is true.* (van Fraassen 1980a: 8)

*OCE* is more modest than the realist thesis above just because the former appeals to the empirical adequacy of scientific theories rather than the truth of those same theories. And this point is not at stake whether we would choose to use *OCE* or *RCE*.

*Secondly*, James Ladyman challenged CE claims to epistemic modesty by arguing, that constructive empiricism is committed to epistemic modal realism (Ladyman 2000: 855). This lively debated issue, however, again depends on the concept of observability and the belief in observability, but not on the nature of the agent of belief.

*Third*, as was suggested before, with regard to the dispute between van Fraassen and Rosen, appeal to the epistemic community might be understood as an implicit appeal to some form of social ontology: because constructive empiricists use the concept of epistemic community, they are expected to explain on what basis scientific community is treated as a social entity and how one should apply, for example, the concept of belief (which is more readily and naturally applicable to a single cognitive agent) to a group of believers.

*In conclusion*, with regard to (iii), *RCE* can do at least as well as *OCE*.

Probably the most widely debated aspect of CE is the distinction between the observables and the unobservables. According to CE, this distinction cannot be suitably defined using only armchair philosophy, rather, "if there are limits to observation, these are a subject for empirical science, and not for philosophical analysis" (van Fraassen 1980a: 57). If, however, a single person can engage in the legitimate scientific activity and we choose to interpret this activity by proposing *RCE*, the question whether constructive empiricists can

coherently maintain both their thesis and van Fraassen's contention that scientific theories are themselves the only source we can hope for to acquire information about what is observable, will depend purely on considerations relating to how we treat *OCE* (or *RCE*) as theses about scientific theories and not about agents who propose those theories.

For example, Fred A. Muller in his philosophical-scientific definition of observability (Muller 2005: 83) suggests treating the term "observable" as a three-place predicate which is a function of the object to which the predicate is applied, the scientific community which has the theory about this object, and the theory on account of which we try to understand whether the object in consideration is observable. This definition can be easily recast in terms of a single person, just by interpreting one variable not as meaning the epistemic community but simply a single scientist. And this in no way impedes any considerations regarding the concept of observability in the discussions that follow (Dicken and Lipton 2006; Muller and van Fraassen 2008; Dicken 2009b). Thus, (iv) is invariant under the transformation from *OCE* to *RCE*.

The distinction between the pragmatic acceptance and the epistemic belief (v) also should equally well work (or not work) for both *OCE* and *RCE*. It has been argued that CE cannot maintain meaningful distinction between acceptance of the whole theory and the belief that the theory is empirically adequate, because if scientists did everything as if they believed the whole theory, it means exactly that scientists believe the whole theory. That is why Paul Horwich calls belief/acceptance the "distinction without a difference" (Horwich 1991: 3).

Again, it seems that CE has a way out of this problem (Kukla 1998: 107-108; Dudau 2002: 81-86). In this paper, however, what is important is that it is not the agent of belief or acceptance who is at issue here, but rather the content of the particular belief and the possibility to recognize it. Actually, the problem of this distinction is often argued exactly as if belief and acceptance of one scientist would be involved. Thus *OCE* and *RCE* is on equal footing here as well.

Can there in principle be some other issue, where it would appear that *RCE* is in some relevant sense different from *OCE*? Perhaps, but I do not think it is easy to find one. If anything, *RCE* appears to be preferable to *OCE* not only because it dissolves all problems related to the concept of epistemic community, but also because in multiple instances it seems to be easier to talk about the beliefs and actions of a single scientist rather than about those of the whole community.

## Conclusion

In this paper I have presented four thought experiments or four cases of possible epistemic practices: the case of Jane Doe, a lonely scientist who continues to pursue the scientific activity after every other member of her epistemic community had been destroyed; the case of Cro-Magnon scientist, who just started doing primitive science without any pretense of communicating his findings to anyone else; and two cases of complex extraterrestrial life forms, to one of which even the concept of personhood is not readily applicable. I noted, that in those cases arguments appealing to the concept of "epistemic community" collapse.

Moreover, I have argued that despite possible contradictions (namely, the argu-

ment that Jane Doe acts as a member of “virtual” scientific community and the argument that language, and thus scientific theories, are impossible without a rich community of science), these cases are legitimate possible cases of scientific activity. Thus, constructive empiricism should account for these cases and the easiest way to do so is by reformulating the main thesis of constructive empiricism (*OCE*) into the simplified thesis (*RCE*), which states that simply a *scientist* (and not science as such or epistemic community) is the one who seeks empirically adequate theories. This reformulation (from *OCE* to *RCE*) would destroy any argument appealing to the concept of epistemic community against CE in a decisive manner and would straightforwardly account for the possible single-scientist scientific practices.

This reformulation does not change the nature of constructive empiricism and is well fit to replace *OCE* in the familiar constructive empiricism debates: about observable/unobservable distinction, distinction between epistemic belief and pragmatic acceptance, rationality of science as depicted by constructive empiricism, about ontological (or epistemic) modesty of empiricism as compared to scientific realism.<sup>3</sup>

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## KONSTRUKTYVUSIS EMPIRIZMAS BE EPISTEMINĖS BENDRUOMENĖS

### Justas Bujokas

**Santrauka.** Konstruktyvusis empirizmas (KE), plačiai nagrinėta ir nagrinėjama Baso van Fraasseno antirealistinė mokslo koncepcija, siūlo filosofinę mokslo praktikos interpretaciją. KE filosofijoje mokslo praktikos subjektas yra, kaip nurodo pats van Fraassenas, vadinamoji episteminė bendruomenė. Tačiau Williamas Seageris prieštarauja, kad jeigu KE šalininkai remiasi episteminės bendruomenės sąvoka, tai KE filosofija neišvengiamai numato, jog mokslininkai tiki nestebimaisiais esiniais. Maža to, Simone Bahrenberg ir kt. teigia, kad nuo to, iš ko sudaryta episteminė bendruomenė, priklauso, kurie esiniai yra stebimieji, todėl *stebimumas* negali būti objektyvi savybė, o KE laikosi nuostatos, kad stebimumas yra objektyvi savybė.

Straipsnyje, remiantis keturiais mintiniais eksperimentais, aptariamas atskiras hipotetinis episteminės bendruomenės, kurioje tėra vienas asmuo, atvejis ir teigiama, kad šiuo hipotetiniu atveju Seagerio bei Bahrenberg ir kt. kontrargumentai nepagrįsti: Seagerio reikalavimas kitų episteminės bendruomenės narių liudijimus laikyti episteminiais įsitikinimais grindžiančiais duomenimis tiesiog neveikia; o, *contra* Bahrenberg ir kt., tai, kas *stebima vienam asmeniui*, KE filosofijoje yra neproblemiškai objektyvu. Remiantis šia įžvalga teigiama, kad konstruktyvusis empirizmas būtų stipresnė filosofinė pozicija, jeigu performuluotų savo tezę taip, lyg ši aprašytų vieną pažįstantįjį subjektą (asmenį, mokslininką), nes i) taip ne tik kartą ir visiems laikams atremtų visus episteminės bendruomenės sąvoka besikliaujančius prieštaravimus, bet ir ii) šiuo pakeitimu tiesiogiai atsižvelgtų į kai kuriuos mokslo praktikos atvejus, į kuriuos nemodifikuota KE tezę taip akivaizdžiai atsižvelgti negali. Siūlomas KE nuostatos pakeitimas iii) išlaiko pagrindinius KE pozicijos aspektus, – skirtį tarp stebimųjų ir nestebimųjų esinių, skirtį tarp *priėmimo* ir *įsitikinimo*, episteminės ekonomijos principą ir mokslo racionalumo principą, – bent tiek pat pagrįstus, kiek ir naudojant originaliąją van Fraasseno tezę.

**Pagrindiniai žodžiai:** konstruktyvusis empirizmas, episteminė bendruomenė, stebimumas, objektyvumas

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