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THE PESSIMISTIC INDUCTION AND THE GOLDEN RULE*

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Abstract. *Nickles advocates scientific antirealism by appealing to the illusion hypothesis, the pessimistic induction over scientific theories, Darwin's evolutionary theory, and the problem of underdetermination. I object that both the illusion hypothesis and evolutionary theory clash with the pessimistic induction and with the problem of underdetermination. I also argue that Nickles's positive philosophical theories are subject to Park's pessimistic induction over antirealists. Finally, I apply the Golden Rule to antirealists, viz., if antirealists do not want scientists to run the pessimistic induction over antirealists, antirealists ought not to run the pessimistic induction over scientific theories.*

Keywords: *end of history illusion, evolutionary theory, Golden Rule, pessimistic induction, underdetermination*

This paper defines scientific realism as the view that "we know that we already have the truth, or something very close" (Nickles 2017: 159), and scientific antirealism as the view that we do not "have sufficient evidence and argument to conclude with confidence that even our most mature theories are true, or very nearly, that at best minor tweaking will be necessary" (Nickles 2017: 151). Thomas Nickles (2017) rejects realism and accepts antirealism by appealing to various theoretical resources: the illusion hypothesis (Quoidbach, Gilbert, and Wilson 2013), the pessimistic induction over scientific theories, Darwin's evolutionary theory, and the problem of underdetermination.

This paper aims to show that Nickles's case against realism fails. In Section 1, I expound the aforementioned theoretical resources one by one, and then argue that both the illusion hypothesis and evolutionary theory clash with the pessimistic induction and with the problem of underdetermination. In Section 2, I show that Nickles's positive philosophical theories fall prey to Park's (2017a) pessimistic induction over antirealists. I also argue that the Golden Rule applies to antirealists on epistemic matters, so if antirealists do not want scientists to run the pessimistic induction over antirealists, antirealists ought not to run the pessimistic induction over scientific theories.

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1. Nickles's Theoretical Resources

1.1. The Illusion Hypothesis and the Pessimistic Induction

Jordi Quoidbach, Daniel Gilbert, and Timothy Wilson (2013) discovered a cognitive illusion called "the end of history illusion". As we age, our preferences, values, and personalities undergo radical changes. We, however, tend to believe that they will undergo little change during the rest of our lives, despite believing that they have undergone radical changes in the past. Quoidbach, Gilbert, and Wilson (2013) asked one group of subjects how much they had changed over the past ten years, and another group how much they would change over the next ten years. There was a wide discrepancy between the reports of the two groups, which indicates that "people underestimate the extent to which their personalities, values, and preferences will change in the future" (Quoidbach et al. 2013: 98). The phrase "the end of history illusion" originates from the observation that people regard the present as a watershed moment at which their eventfulness in their lives ends. Let me call *the illusion hypothesis* Quoidbach, Gilbert, and Wilson's psychological hypothesis that people tend to think that their lives in the future will not be dynamic, even though they think that their lives in the past were dynamic.

According to Nickles, the illusion hypothesis has an important implication for realism. Realism holds that our best current theories are (approximately) true, which implies that there will be few innovative changes in future science, although there have been many innovative changes in past science. The end of history illusion erroneously "leads us to believe that the future will be relatively flat, uneventful, in relevant respects (cf. Quoidbach et al. 2013)" (Nickles 2017: 152). Realists are those "who cannot fully resist the temptations of the cognitive-historical illusions" (Nickles 2017: 162). Since realism originates from the cognitive illusion, we should reject it and accept antirealism.

Nickles grounds antirealism not only on the illusion hypothesis but also on the pessimistic induction over scientific theories. It holds that the downfall of present theories, such as the oxygen theory of combustion and the germ theory of diseases, can be extrapolated from that of past theories, such as the phlogiston theory of combustion and the miasma theory of diseases (Poincaré 1905/1952: 160; Mach 1911: 17; Hesse 1976: 266; Laudan 1977: 126; Putnam 1978: 25; Wray 2007; Wray 2010: 371; Wray 2013: 4327; Khalifa 2010). For the sake of argument, this paper agrees with Nickles that the pessimistic induction is correct.[1] The purpose of this paper is not to criticize it, but rather to expose its disastrous implications for antirealists.

Nickles says, "just about every attempt to predict long-term futures has been a ludicrous failure, including scientific and technological futures and even when 'long term' is only 100 years" (2017: 153). Just as we think that there will be few changes in our future, while thinking that there have been many changes in our past, so realists think that there will be few innovations in future science, while thinking that there have been many innovations in past science. In addition, just as we are wrong about our lives in the future, so realists are wrong about future

[1] See Park (2018a) for a summary of problems with the pessimistic induction.

science. All these mistaken views are due to the end of history of illusion.

An influential criticism of the pessimistic induction is that present theories are more successful than past theories (Musgrave 1985: 211; Leplin 1997: 141; Doppelt 2007: 111; Doppelt 2011; Saatsi 2009: 358; Devitt 2011: 292; Fahrbach 2011a; Fahrbach 2011b: 1290; Park 2011: 80; Mizrahi 2013; Doppelt 2014). Present scientists use more rigorous methods and more advanced technologies than past scientists did, so the former can explain and predict more phenomena than the latter. The superiority of present theories over past theories nullifies the pessimistic inference from past to present theories.

In response, Nickles presents a brilliant defence of the pessimistic induction, inviting us to imagine what past scientists thought of their theories, and what future scientists will think of ours:

> Why should we think that today's best science is true when past scientists believed the same of their science – which we reject today as badly wrong? The answer some strong realists give is that today's science is now mature, whereas theirs was not. After all, we now know of flaws in their theories, their instrumentation, their experimental design, their goals and standards, etc. But wait! What is to keep our distant successors from saying the same about us? Just because today's most successful theoretical claims seem practically flawless to us does not mean that they really are (Nickles 2017: 153).

Similar arguments are developed by K. Brad Wray (2013: 4327) and Mario Alai (2017: 3282). These philosophers admit that present theories are superior to past theories, but argue that present theories will be overthrown, just as past theories were, on the grounds that our descendants will look at our theories with distain, just as we look at our ancestors' theories with disdain. This defense of the pessimistic induction is impressive and admirable.

What are we to make of Nickles's double-barreled attack on realism? The two barrels, viz., the illusion hypothesis and the pessimistic induction over scientific theories, are incompatible with each other. The pessimistic induction applies to the illusion hypothesis as well as to other scientific hypotheses. It is wrong to think that the pessimistic induction applies to physics, chemistry, and biology, but not to psychology. Many psychological hypotheses have been discarded in the history of psychology. For example, Noam Chomsky (1959) demolished B. F. Skinner's behaviorism with the observation that children could construct new sentences. The pessimistic induction implies that since past psychological hypotheses have been rejected, present psychological hypotheses, including the illusion hypothesis, will also be rejected.

Nickles might reply that present psychological hypotheses are superior to past psychological hypotheses. Present psychologists use more rigorous methods and more advanced instruments to confirm psychological hypotheses. Moreover, present psychologists know about the flaws with past psychological hypotheses. It follows that although behaviorism was discarded, the illusion hypothesis will not be.

My rejoinder to this possible reply is to admit that present psychological hypotheses are superior to past ones, but to argue that future psychologists will look at present psychological hypotheses with disdain, just as present psychologists look at past psychological hypotheses with disdain, and hence that present psychological hy-

potheses will follow the unfortunate path of past psychological hypotheses. Thus, the illusion hypothesis is just as unwarranted as behaviorism was.

This conclusion should be agreeable not only to Nickles but also to Wray and Alai, given that these philosophers stick to the pessimistic induction in spite of the superiority of present theories over past theories, on the grounds that future scientists will look at present theories with disdain, just as present scientists look at past theories with disdain. In a nutshell, their brilliant defense of the pessimistic induction backfires on the illusion hypothesis, and hence on Nickles's case against realism.

1.2. Evolutionary Theory and the Pessimistic Induction

Another influential response to the pessimistic induction is selectivism, according to which present theories preserved some theoretical assumptions of past theories, so future theories will preserve some theoretical assumptions of present theories. Those assumptions are worthy of our beliefs whereas other assumptions are not. Selectivism is endorsed by many prestigious philosophers, such as John Worrall (1989), Philip Kitcher (1993: Chapters 4 and 5), Stathis Psillos (1999: Chapter 6; 2009), Anjan Chakravartty (2008), Patrick Enfield (2008), David Harker (2008), Juha Saatsi (2009), and Peter Vickers (2017).

Nickles presents a novel argument against selectivism making use of evolutionary theory, which claims that the accumulation of small variations makes a huge difference, if enough time passes:

> Note that the realist response to Kuhnian revolution claims – that there was, in fact, a good deal of continuity between the predecessor and successor theory or paradigm – does nothing to address the long-term evolutionary point. You can have all the continuity you want between temporally adjacent work, but over a long enough time the changes can be radical (Nickles 2017: 159).

To take an example, some theoretical assumptions were carried over from the caloric theory of heat to the kinetic theory of heat. But the kinetic theory will be supplanted by an alternative hitherto unconceived, and the alternative will be surpassed by its successor, etc. After enough scientific revolutions, the successive theories of heat will share no theoretical assumptions. Thus, selectivism falls prey to the "basic lesson from evolutionary biology that very slow evolution can be as transformative as you please, given enough time" (Nickles 2017: 158). As far as I can tell, Nickles has ingeniously combined the pessimistic induction with evolutionary theory to discredit selectivism.

On close examination, however, it is incoherent to combine the pessimistic induction with evolutionary theory. Evolutionary theory is one of the present theories at which the pessimistic induction is directed. So if the pessimistic induction is correct, evolutionary theory is unwarranted. If, however, evolutionary theory is warranted, the pessimistic induction is incorrect. Nickles cannot have both the pessimistic induction and evolutionary theory. It is just as wrong to think that biology is exempted from the pessimistic induction, as it is to think that psychology is exempted from the pessimistic induction.

Nickles's appeal to evolutionary theory resembles those of Thomas Kuhn and Wray. Appealing to evolutionary theory, Kuhn (1962/1970: 172) argues that scientific de-

velopment is not a truth-oriented process, just as biological evolution is not a goal-oriented process. In a similar vein, Wray (2011: 136) argues that science loses old concepts when a scientific revolution occurs, just as organisms lose their morphologies when speciation occurs. Park (2017b: 325–328) objects that it is self-refuting for Kuhn and Wray to appeal to evolutionary theory to justify their revolutionary philosophical views about science. Kuhn's (1962/1970) revolutionary philosophy of science implies that evolutionary theory flounders in an ocean of anomalies and will be displaced by an alternative theory. Moreover, evolutionary theory and the alternative will be incommensurable, so that present and future biologists will live in different worlds (Park 2018b: 65). A similar point applies to Wray. Wray's (2011: 136) revolutionary philosophy of science implies that the concepts in evolutionary theory will be dropped, once it is displaced by its successor. Moreover, Wray (2007; 2010: 371; 2013: 4327) vigorously defends the pessimistic induction, which dictates that he should not assent to evolutionary theory. Nickles, Kuhn, and Wray have made the same mistake of appealing to evolutionary theory to support the pessimistic philosophical view about scientific theories, unwittingly and incorrectly presupposing that evolutionary theory is an exception to their pessimistic view about scientific theories.

1.3. Underdetermination, the Illusion Hypothesis, and Evolutionary Theory

Nickles rejects Hilary Putnam's (1975: 73) no-miracles argument for realism. To put briefly, the no-miracles argument holds that the truth of successful theories best explains their success, so successful theories are true. Nickles objects that antirealists "do not regard apparent explanatory success as sufficient reason to conclude truth, owing to underdetermination, etc., yet the inference to truth as the best explanation for the success of science makes a similar move at the metalevel" (2017: 159). In other words, antirealists do not believe that explanatory success is a reliable indicator of truth due to underdetermination, but the no-miracles argument relies on explanatory success, so it begs the question against antirealists.

Nickles's appeal to underdetermination, however, is problematic. Underdetermination nullifies his previous appeal to the illusion hypothesis and evolutionary theory. The illusion hypothesis is advanced to *explain* the reports of the two groups of subjects in the psychological experiment mentioned above. Evolutionary theory is advanced to *explain* various biological phenomena (Darwin 1859/1993). Both the illusion hypothesis and evolutionary theory, however, are underdetermined, so even if they best explain phenomena, they are unwarranted. You can achieve nothing by appealing to the unwarranted hypothesis and the unwarranted theory.

2. The Golden Rule

Park (2017a) advances the pessimistic induction over antirealists. Let me summarize it and elucidate its negative consequence for antirealists, including Nickles. The purpose of conjuring up the pessimistic induction over antirealists is to yield an opportunity for antirealists to imagine how scientists would respond to antirealists' pessimistic induction over scientific theories.

Park (2017a) observes that antirealists have made many philosophical mistakes. For example, Stanford (2000) suggests

that a false theory is successful because it is predictively similar to a true theory. This suggestion is similar to the one that a coin is round because it is similar to another coin in terms of shape. Both suggestions put the cart before the horse. We should rather say that a coin is similar to another coin because they are round. Similarly, we should rather say that a false theory is predictively similar to a true theory because they are successful (Park 2003). To take another example, van Fraassen (1989: 143) runs the argument from a bad lot against inference to the best explanation, without realizing that it applies not only to scientific theories but also to van Fraassen's (1980: Chapter 5) contextual theory of explanation. Park concludes that antirealists "have made philosophical mistakes in the past, so they must be making philosophical mistakes now" (2017a: 31).[2]

Nickles is an antirealist, so he is susceptible to Park's pessimistic induction over antirealists. Nickles's positive philosophical theories, whatever they might be, will be thrown out simply because antirealists have made philosophical mistakes in the past. For example, Nickles defends what might be called the craft theory of scientific progress, according to which scientific progress "is a matter of trial and error, constrained by what is already known, and by current desiderata, a form of artificial selection" (2016: 379). We ought to reject it because it is proposed by an antirealist.

Nickles might object that it is unfair to predict that his positive philosophical theories will be abandoned without even specifying his arguments for them. Predicting the future of his positive philosophical theories requires that we should thoroughly evaluate his arguments for them. If the arguments are strong, we should predict that his theories will not be overturned; if they are weak, we should predict that they will be overturned. Our prediction about the fate of his theories should be predicated not on whether his predecessors have made mistakes or not, but on whether the arguments for them are strong or weak.[3]

In reply, I point out that the pessimistic induction over antirealists merely mirrors the pessimistic induction over scientific theories. When pessimists run the pessimistic induction over scientific theories, they do not even specify scientists' arguments for present theories, to say nothing of thoroughly evaluating them. Their predictions about the fate of present theories rest exclusively on the historical fact that past theories were refuted. Nickles is not an exception on this account. I am merely playing a pessimist, treating Nickles's philosophical theories in the way that pessimists treat scientific theories. If my treatment of his philosophical theories is unfair, pessimists' treatment of scientific theories is equally unfair, in which case the pessimist program collapses altogether.

Antirealists might argue that their philosophical theories are better than those of their predecessors', so it is illegitimate to predict the downfall of their theories from that of their predecessors' theories. This move, however, is vulnerable to the objection that our descendants will look at their philosophical theories with disdain, just as we look at their predecessors' philosophical theories with disdain. Thus,

[2] Similar arguments against antirealists were constructed by Park (2014), Moti Mizrahi (2016), and Park (2017c).

[3] Park (2017d: 99) develops this line of thinking to defend present scientific theories from the pessimistic induction over scientific theories.

antirealists' philosophical theories fall prey to the aforementioned brilliant defense of the pessimistic induction over scientific theories advanced by Nickles (2017: 153), Wray (2013: 4327), and Alai (2017: 3282).

Antirealists might now admit that their philosophical theories will be overthrown, but insist that they will not be overthrown *in toto*. There is a grain of truth in their positive theories that will be carried over to their successors. This move, however, is susceptible to the objection that if enough time passes, antirealists' successive theories will not share any assumptions. It follows that no component of their philosophical theories is worthy of our belief.

Moreover, if antirealists resist the pessimistic induction over antirealists, realists can accuse them of being caught in the end of history illusion. After all, the antirealist belief that their present philosophical theories will not undergo radical change originates from the illusion hypothesis that the future will be monotonous, although the past was eventful. It is wrong for antirealists to think that realists' resistance to the pessimistic induction over scientific theories stems from the end of history illusion, but that antirealists' resistance to the pessimistic induction over antirealists stems from good epistemic reasons.

In this section, I ran the pessimistic induction over antirealists in response to antirealists' pessimistic induction over scientific theories. An anonymous referee objects that my response is built upon the distinction between science and philosophy of science, so I have the burden to explicate the distinction.

In this context, I define science as an attempt to understand the world, and philosophy of science as an attempt to understand science. This distinction, however, would be rejected by many philosophers, such as Bas van Fraassen (1989: 131), Larry Laudan (1981: 19), Greg Frost-Arnold (2010), and Mizrahi (2012). These philosophers embrace naturalism according to which there is no strict distinction between science and philosophy, and there is no methodological difference between them either. In the naturalist vein, Nickles accuses realism of making an *unscientific* prediction that present scientific theories will not be overthrown. He says, "such a claim is not really a scientific prediction, I would claim, but a forecast or even a prophesy" (2017: 157). Naturalists, such as Nickles, have no choice but to accept my view that if scientists and scientific theories are susceptible to pessimistic inductions, philosophers and philosophical theories are also susceptible to pessimistic inductions.

The pessimistic induction over antirealists has the implication that the moment antirealists entertain philosophical theories, they are fated to be discarded. Antirealists might complain that the pessimistic induction dampens their aspiration to develop new philosophical theories, i.e., it diminishes their motivation to come up with new philosophical theories. After all, if antirealists' philosophical theories have such a dismal fate, it is pointless for antirealists to conceive of them and gather evidence for them. Since the pessimistic induction has such a negative impact on antirealists' philosophical enterprise, it is a deplorable idea and should be dismissed.

This complaint, however, is not available to Nickles. Consider how Nickles (2017: 161-162) responds to Karl Popper's (1963: Chapter 3) similar objection to instrumentalism. Popper accuses instrumen-

talism of dampening scientists' curiosity and diminishing their motivation to conduct research into unobservables. Popper's critique of instrumentalism can be applied to the pessimistic induction over scientific theories. That is, the pessimistic induction diminishes scientists' motivation to conduct research into unobservables and to come up with new scientific theories. Nickles, however, denies that the pessimistic induction diminishes scientists' motivation to develop and defend new theories, saying that "the position I defend encourages talented investigators to be bolder, to treat the future as still open to significant changes" (2017: 161).

Just as Nickles denies that the pessimistic induction over scientific theories decreases scientists' motivation to conduct research into unobservables, so I deny that the pessimistic induction over antirealists decreases antirealists' motivation to theorize about science. Just as Nickles encourages scientists to be bolder and come up with new scientific theories despite believing that they will only succumb to the pessimistic induction over scientific theories, so I encourage antirealists to be bolder and come up with new philosophical theories despite believing that they will only succumb to the pessimistic induction over antirealists. If it is rational for Nickles to encourage scientists to do the futile things, it is also rational for me to encourage antirealists do to the futile things. His position and my position rise or fall together.

In the face of this objection, antirealists might contend that we should treat the two pessimistic inductions differently. Specifically, the pessimistic induction over antirealists decreases antirealists' motivation to theorize about science, but the pessimistic induction over scientific theories does not decrease scientists' motivation to conduct research into unobservables. Since the pessimistic induction over antirealists has a negative impact on antirealists, it should be discarded. By contrast, since the pessimistic induction over scientific theories does not have a negative impact on scientists, it should be retained.

This move, however, would run into some disconcerting questions: Why is it that the pessimistic induction over antirealists dampens their aspiration for truths about science but the pessimistic induction over scientific theories does not dampen scientists' aspiration for truths about unobservables? Do scientists have stronger minds than antirealist philosophers? Do scientists have more fortitude and endurance than antirealist philosophers, enabling them to maintain their research into unobservables despite antirealist philosophers' negative expectations? Antirealist philosophers owe us convincing answers to these questions. Without such answers, scientists could take the opposite position: the pessimistic induction over scientific theories dampens scientists' aspiration for truths about unobservables, but the pessimistic induction over antirealists does not dampen their aspiration for truths about science. Consequently, we should retain the pessimistic induction over antirealists, but discard the pessimistic induction over scientific theories.

Let me draw a philosophical moral from my discussion of Nickles's case for antirealism so far. When antirealists defend the pessimistic induction over scientific theories, they might as well imagine how scientists would respond to it. Scientists might run the pessimistic induction over antirealists, reminding antirealists of the Golden Rule: Do unto others as you would have them do unto you. There is no reason for thinking

that the Golden Rule ranges over moral matters, but not over epistemic matters. So if antirealists do not want scientists to run the pessimistic induction over antirealists, antirealists ought not to run the pessimistic induction over scientific theories.

Conclusion

Nickles appeals to the illusion hypothesis, the pessimistic induction over scientific theories, evolutionary theory, and the problem of underdetermination to refute realism and to defend antirealism. Specifically, he contends that realism arose from the end of history illusion, that the demise of present theories can be inferred from that of past theories, successive theories do not share theoretical assumptions if enough times passes, and that underdetermination bars explanatory success from establishing truth.

I objected that the illusion hypothesis and evolutionary theory are not insulated from the pessimistic induction over scientific theories and from the problem of underdetermination. The pessimistic induction implies that the illusion hypothesis and evolutionary theory will be discarded, just as their predecessors were discarded. The problem of underdetermination implies that the illusion hypothesis and evolutionary theory are unwarranted because they are underdetermined, so their explanatory success does not show that they are true. In short, it is incoherent for Nickles to appeal to the conflicting theoretical resources.

Finally, I argued that the pessimistic induction over antirealists spells doom for Nickles's positive philosophical theories. The purpose of running the pessimistic induction over antirealists against his positive philosophical theories was to draw a philosophical moral: The Golden Rule applies to epistemic matters as well as to moral matters, so antirealists ought to project themselves into scientists' position before they run the pessimistic induction over scientific theories.

REFERENCES

Alai, M., 2017. Resisting the Historical Objections to Realism: Is Doppelt's a Viable Solution? *Synthese* 194(9): 3267–3290.

Chakravartty, A., 2008. What You Don't Know Can't Hurt You: Realism and the Unconceived. *Philosophical Studies* 137(1): 149–158.

Chomsky, N., 1959. Review of Verbal Behavior. *Language* 35(1): 26–58.

Darwin, C., 1859/1993. *The Origin of Species*. In: *The Portable Darwin*, ed. P. Graham. Duncan Porter and Paris: Penguin Books, 318–321.

Devitt, M., 2011. Are Unconceived Alternatives a Problem for Scientific Realism? *Journal for General Philosophy of Science* 42(2): 285–293.

Doppelt, G., 2007. Reconstructing Scientific Realism to Rebut the Pessimistic Meta-induction. *Philosophy of Science* 74(1): 96–118.

Doppelt, G., 2011. From Standard Scientific Realism and Structural Realism to Best Current Theory Realism. *Journal for General Philosophy of Science* 42(2): 295–316.

Doppelt, G., 2014. Best Theory Scientific Realism. *European Journal for Philosophy of Science* 4(2): 271–291.

Enfield, P., 2008. Review of P. Kyle Stanford's "Exceeding Our Grasp: Science, History, and the Problem of Unconceived Alternatives". *The British Journal for the Philosophy of Science* 59(4): 881–895.

Fahrbach, L., 2011a. How the Growth of Science Ends Theory Change. *Synthese* 180(2): 139–155.

Fahrbach, L., 2011b. Theory Change and Degrees of Success. *Philosophy of Science* 78(5): 1283–1292.

Frost-Arnold, G., 2010. The No-miracles Argument: Inference to an Unacceptable Explanation. *Philosophy of Science* 77(1): 35–58.

Harker, D., 2008. P. Kyle Stanford "Exceeding Our Grasp: Science, History, and the Problem of Unconceived Alternatives". *Philosophy of Science* 75(2): 251–253.

Hesse, M., 1976. Truth and the Growth of Scientific Knowledge. *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association* 2: 261–280.

Khalifa, K., 2010. Default Privilege and Bad Lots: Underconsideration and Explanatory Inference. *International Studies in the Philosophy of Science* 24(1): 91–105.

Kitcher, P., 1993. *The Advancement of Science: Science without Legend, Objectivity without Illusion*. New York: Oxford University Press.

Kuhn, T., 1962/1970. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Laudan, L., 1977. *Progress and Its Problems: Towards a Theory of Scientific Growth*. California: University of California Press.

Laudan, L., 1981. A Confutation of Convergent Realism. *Philosophy of Science* 48(1): 19–49.

Leplin, J., 1997. *A Novel Defense of Scientific Realism*. New York: Oxford University Press.

Mach, E., 1911. *History and Root of the Principle of the Conservation of Energy*, transl. P. E. B. Jourdain. Chicago: Open Court Publishing Company.

Mizrahi, M., 2012. Why the Ultimate Argument for Scientific Realism Ultimately Fails. *Studies in History and Philosophy of Science* 43(1): 132–138.

Mizrahi, M., 2013. The Pessimistic Induction: A Bad Argument Gone Too Far. *Synthese* 190(15): 3209–3226.

Mizrahi, M., 2016. Historical Inductions, Unconceived Alternatives, and Unconceived Objections. *Journal for General Philosophy of science* 47(1): 59–68.

Musgrave, A., 1985. Realism vs. Constructive Empiricism. In: *Images of Science: Essays on Realism and Empiricism*, eds. P. Churchland, C. Hooker. Chicago: The University of Chicago Press, 197–221.

Nickles, T., 2016. Perspectivism Versus a Completed Copernican Revolution. *Axiomathes* 26: 367–382.

Nickles, T., 2017. Cognitive Illusions and Nonrealism: Objections and Replies. In: *Varieties of Scientific Realism: Objectivity and Truth in Science*, ed. E. Agazzi. Switzerland: Springer International Publishing, 151–163.

Park, S., 2003. Ontological Order in Scientific Explanation. *Philosophical Papers* 32(2): 157–170.

Park, S., 2011. A Confutation of the Pessimistic Induction. *Journal for General Philosophy of Science* 42(1): 75–84.

Park, S., 2014. A Pessimistic Induction against Scientific Antirealism. *Organon F* 21(1): 3–21.

Park, S., 2017a. Scientific Antirealists Have Set Fire to Their Own Houses. *Prolegomena* 16(1): 23–37.

Park, S., 2017b. Problems with Using Evolutionary Theory in Philosophy. *Axiomathes* 27(3): 321–332.

Park, S., 2017c. Why Should We Be Pessimistic about Antirealists and Pessimists? *Foundations of Science* 22(3): 613–625.

Park, S., 2017d. Selective Realism vs. Individual Realism for Scientific Creativity. *Creativity Studies* 10(1): 97–107.

Park, S., 2018a. The Grand Pessimistic Induction. *Review of Contemporary Philosophy* 17: 7–19.

Park, S., 2018b. Can Kuhn's Taxonomic Incommensurability Be an Image of Science? In: *The Kuhnian Image of Science: Time for a Decisive Transformation?*, ed. M. Mizrahi. London: Rowman & Littlefield, 61–74.

Poincaré, H., 1905/1952. *Science and Hypothesis*. New York: Dover.

Popper, K., 1963. *Conjectures and Refutations*. New York: Routledge & Kagen Paul.

Psillos, S., 1999. *Scientific Realism: How Science Tracks Truth*. New York: Routledge.

Psillos, S., 2009. Grasping at Realist Straws. Review Symposium. *Metascience* 18: 363–370.

Putnam, H., 1975. *Mathematics, Matter and Method (Philosophical Papers, vo. 1)*. Cambridge: Cambridge University Press.

Putnam, H., 1978. *Meaning and the Moral Sciences*. London: Routledge & K. Paul.

Quoidbach, J., Gilbert, D., Wilson, T., 2013. The End of History Illusion. *Science* 339(6115): 96–98.

Saatsi, J., 2009. Grasping at Realist Straws. Review Symposium. *Metascience* 18: 355–362.

Stanford, P. K., 2000. An Antirealist Explanation of the Success of Science. *Philosophy of Science* 67(2): 266–284.

van Fraassen, B., 1980. *The Scientific Image*. Oxford: Oxford University Press.

van Fraassen, B., 1989. *Laws and Symmetry*. Oxford: Oxford University Press.

Vickers, P., 2017. Understanding the Selective Realist Defence against the PMI. *Synthese* 194(9): 3221–3232.

Worrall, J., 1989. Structural Realism: The Best of Both Worlds. *Dialectica* 43: 99–124.

Wray, K. B., 2007. A Selectionist Explanation for the Success and Failures of Science. *Erkenntnis* 67(1): 81–89.

Wray, K. B., 2010. Selection and Predictive Success. *Erkenntnis* 72(3): 365–377.

Wray, K. B., 2011. *Kuhn's Evolutionary Social Epistemology*. Cambridge: Cambridge University Press.

Wray, K. B., 2013. Pessimistic Induction and the Exponential Growth of Science Reassessed. *Synthese* 190(18): 4321–4330.

PESIMISTINĖ INDUKCIJA IR AUKSINĖ TAISYKLĖ

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Santrauka. Nicklesas (2017) gina mokslinį antirealizmą remdamasis iliuzijos hipoteze (Quoidbach, Gilbert, Wilson 2013), pesimistinės indukcijos išvada apie mokslines teorijas, Darwino evoliucijos teorija ir nepakankamo apibrėžtumo problema. Straipsnyje kritikuoju tokią argumentaciją ir teigiu, kad ir iliuzijos hipotezė, ir evoliucinė teorija kertasi ir su pesimistinės indukcijos išvada, ir su nepakankamo apibrėžtumo argumentu. Be to, teigiu, kad Nickleso pozityvios filosofinės išvados neatlaiko Parko (2017a) pesimistinės indukcijos išvados, nukreiptos prieš antirealistus. Pabaigoje aš pritaikau auksinę taisyklę antirealistams: jeigu antirealistai nenori, kad mokslininkai taikytų pesimistinę indukciją antirealistų atžvilgiu, tai antirealistai neturėtų jos taikyti prieš mokslo teorijas.

Pagrindiniai žodžiai: istorijos pabaigos iliuzija, evoliucijos teorija, auksinė taisyklė, pesimistinė indukcija, nepakankamo apibrėžtumo problema

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