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Susan Haack

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"Extreme Scholastic Realism:" Its Relevance to Philosophy of Science Today*

... the question of nominalism and realism—that question on which each new-fledged masculine intellect likes to try its powers of disputation . . .

Chauncey Wright¹

It is clear that Peirce regarded the question of nominalism and realism not as a mere intellectual exercise, but as crucially important, still "as pressing" he wrote in 1898, "as ever it was." "Everyone ought to be a nominalist at first," he went on, "and to continue in that opinion until he is driven out of it by *force majeure* of irreconcilable facts" (4.1).² Perhaps Peirce himself was a nominalist at first; but if so he soon found himself driven out of that opinion, obliged to adopt, in his mature philosophy, what he described as "a scholastic realis[m] of a somewhat extreme stripe" (5.470, c.1906). And he came to regard nominalism not only as mistaken, but as pernicious, a "philistine" doctrine (1.383, c.1890) which "blocks the road of inquiry" (1.170, c.1897).

In my youth, I confess, I leaned towards nominalism myself. (So it is with a certain wry amusement that I read the passages in which Peirce complained about the pervasively nominalist tenor and tendency which had, he claimed, long been characteristic of English philosophy.³) But of late I find myself increasingly in sympathy both with Peirce's critique of nominalism, and with the doctrine he called "scholastic realism," and held to be a necessary component of any adequate philosophy of science. I have come to this view in part by reflection on Peirce's characterization of what is at stake in the nominalism/realism debate, and in part also by

reflection on how that characterization may be applied to some current issues and recent developments in the philosophy of science. And my object in the present paper is to articulate these reflections as best I can, first spelling out what I see as the most significant elements of Peirce's characterization of the issues, and then suggesting some ways in which they might be brought to bear on recent work.

"Philosophy," Peirce observed, ought "to trust to the multitude and variety of its arguments . . . Its reasoning should not form a chain . . . but a cable whose fibers may be ever so slender, provided they are sufficiently numerous and intimately connected" (5.265, 1868). His case for scholastic realism conformed rather strikingly to this pattern, marshalling together arguments both logical and phenomenological from his theory of categories, arguments from the history of philosophy, arguments from the philosophy of language, arguments from the philosophy of science. Inevitably, then, in focussing my attention on only some strands, concentrating on the connections between Peirce's scholastic realism and his philosophy of science, I run the risk of doing less than justice to his case; the hope is that since my purpose is rather comparative and constructive than critical it may be justifiable to concentrate on those of his arguments that seem most persuasive and most pertinent to my concerns.

I

Peirce was altogether in favour of Ockham's razor, for all that it was "urged by an illustrious nominalist" (6.274, c.1893). Interpreting it as the unexceptionable methodological principle that one ought to try the simpler before the more complex hypothesis, Peirce acknowledged that Ockham's razor throws the burden of proof on the realist, for nominalism is the simpler hypothesis. That is why everyone ought to be a nominalist at first, and turn to realism only when convinced that the nominalist hypothesis is incapable of explaining undeniable facts.

Whether or not one wants to say that Peirce himself was a no-

nominalist at first, it seems at any rate that there were indeed some nominalistic tendencies in his earlier philosophy which were superseded in his mature commitment to scholastic realism. For instance, his earlier statements of the pragmatic maxim show more sympathy with nominalism than his later, decisively realist versions; and his earlier conceptions of possibility and of probability are more nominalist than his maturer accounts of these notions.⁴ It seems that Peirce came to regard his earlier work as flawed by nominalistic tendencies; certainly the mature Peirce believed that nominalism *is* incapable of explaining undeniable facts.

The mature Peirce came to regard nominalism as responsible for a whole range of philosophical mistakes, so that philosophers with whom he disagreed were almost invariably accused of nominalism. The charge was levelled against, among others, Descartes, Leibniz, Hobbes, Locke, Hume, Kant, Mill, Hegel, and Fichte; against Berkeley and Bain, both of whom Peirce acknowledged as precursors of pragmatism; against fellow pragmatists James and Schiller;⁵ and even against Duns Scotus, to whose realism Peirce referred sympathetically as closely similar to his own, but nevertheless accused of "inclin[ing] too much towards nominalism" (1.560, c.1905). Nor was the allegedly pernicious influence of nominalism confined to philosophy; according to Peirce, nominalism had had deplorable effects in science, even in medicine.⁶

Evidently Peirce regarded the question of nominalism *versus* realism as profoundly consequential; evidently, also, he came to believe there to be extremely persuasive arguments on the realist side. And yet some commentators have found this surprising: some have supposed that pragmatism should regard the whole issue of nominalism and realism as a metaphysical pseudo-problem, others that pragmatism is bound to favour the nominalist party.⁷ So the exegetical task is to get clear exactly what Peirce took to be at issue between nominalism and scholastic realism, exactly what he took the "irreconcilable facts" to be that settle the issue in favour of realism, and why he believed that pragmatism, properly understood, was inherently realistic in character.

Since Peirce claimed that the question of nominalism and realism was, in his time, often misunderstood, it is important to pay particular attention to his statements of the issue. He gave an illuminating brief account of what he took to be at stake when he wrote:

The question . . . is whether *man*, *horse*, and other names of natural classes, correspond with anything which all men, or all horses, really have in common, independent of our thoughts, or whether these classes are constituted simply by a likeness in the way in which our minds are affected by individual objects which have in themselves no resemblance . . . (8.12, 1871)

or, more succinctly yet:

. . . the question . . . [is] . . . whether *laws* and *general types* are figments of the mind or are real. (1.16, 1903)

The realist answer, of course, is that laws and general types are real; Peirce's "extreme scholastic realism" could be summed up in the sentence: there are real generals.

As the quoted passages indicate, "real" is contrasted with "figment;" it means "independent of thought." This is why Peirce insisted that conceptualism is nothing but a disguised form of nominalism;⁸ for nominalism, understood as the thesis that men, horses, or whatever have nothing but the name in common, are, from the point of view of this categorization, not significantly different; both deny that generals are independent of thought, i.e., that they are real. For Peirce, furthermore, "real" must not be identified with "exists."⁹ Though what exists is real, what is real may not exist; existence is reaction, interaction—the characteristic mode of being of particulars, of seconds. This is why Peirce made a distinction between scholastic realism and what he called "nominalistic platonism:"¹⁰ the thesis that universals like "man" or "horse" refer to abstract particulars, to existents. Peirce objected to nominalism and conceptualism because they deny that generals

are real; he objected to nominalistic platonism because it asserts that generals exist. What is at issue is apt to be misunderstood, then, because, on the one hand, conceptualism and nominalism are thought to be significantly different positions when really they are essentially alike, and, on the other, nominalistic platonism is confused with genuine realism when really they are essentially different. In short:

- nominalism and conceptualism deny that generals are real;
- nominalistic platonism asserts that generals exist;
- scholastic realism asserts that there are real generals (but denies that generals exist).

I should stress that, as I understand it, Peirce's position was that there are real generals, not that generals are real. The point is that he did not hold that all common nouns represent real generals, only that some may. On this he took issue even with Scotus, whose "halting realism" (6.175, 1906) he described as "separated from nominalism only by the division of a hair" (8.11, 1871). The reality of a common nature, Peirce argued, does not follow merely from the availability of a general term; rather, it is a matter for empirical investigation which words classify together things which really are, independent of our classification, of a kind. The Scotists, Peirce observed, "were utterly uncritical in accepting classes as natural, and seemed to think that ordinary language was a sufficient guarantee in the matter;" as a result "they set up their . . . logical distinctions as precluding all physical inquiry" (6.361, c.1902).

That there are real generals is, to be sure, a metaphysical claim; but a metaphysical claim which would be quite legitimate by the standards of Peirce's mature interpretation of the pragmatic maxim. Though Peirce observed that:

[The pragmatic maxim] will serve to show that almost every proposition of ontological metaphysics is either meaningless gibberish—one word being defined by other

words, and they by still others, without any real conception being reached—or else is downright absurd. (5.423, 1905)¹¹

And though he had written in 1903 that "in its present condition" metaphysics "is a puny, rickety and scrofulous science" (6.6), he did not hold that all metaphysical inquiry was really about meaningless pseudo-disputes. The passage describing "ontological metaphysics" as "gibberish," quoted above, continues:

. . . all such rubbish being swept away, what will remain of philosophy will be a series of problems capable of investigation . . . by the true sciences.

One of the distinguishing characteristics of Peirce's mature pragmatism, of his pragmatism, is precisely that, unlike other forms of "prope-positivism," it allows for the "retention of a purified philosophy" (also 5.423). This "purified philosophy" is "scientific metaphysics," distinguished from the disreputable ontological kind by virtue of the fact that it uses the scientific method.

Peirce's scholastic realism is best conceived, then, as a piece of scientific metaphysics, as a kind of high-level abductive hypothesis. Peirce conceded that scholastic realism does not have direct experiential consequences; but then neither, as he was also aware, do theoretical statements of science.¹² Looked at from a holistic perspective, however, scholastic realism is seen to have *indirect* experiential consequences, as scientific theories do.

Of course, nominalism is also an abductive hypothesis of scientific metaphysics, and one which, in virtue of its greater simplicity, has a better *prima facie* standing than scholastic realism. This leads one directly to the question of what the "irreconcilable facts" are which led Peirce to conclude that scholastic realism must, nevertheless, be accepted.

One central *motif* is clear: scholastic realism, Peirce believed, is required to explain how science is possible.¹³ Science seeks to explain natural phenomena; this it can do only if there are real laws

to be discovered; and this in turn requires that there be real kinds of things in the world. In somewhat fuller form, the argument would run as follows: science aims not simply to describe but to *explain* how things are; this means that it seeks, not simply true statements of regularity, but genuine *laws*; true generalizations, that is, which govern not only all actual, but all *possible*, instances which say what *would* happen if . . . , not just what does happen when . . . ; otherwise, *prediction* would be impossible and *induction* baseless; and there would be such laws only if there are kinds of thing in the world which really do behave in a lawlike way, only, that is, if there are real kinds, *real generals*. The nominalist picture is simpler than the realist; but it cannot explain how scientific inquiry is possible.

Peirce proposed to prove nominalism false thus: holding up a stone, he asked his audience to agree that they could predict that, if he were to drop it, it would fall.¹⁴ If they admit that they can indeed predict what will happen, he argued, they must agree that there are real laws, for a mere generalization about actual droppings and fallings, as opposed to a genuine law about what would happen in all cases of a stone's being dropped (if unsupported, etc.) would give no grounds for the prediction. Peirce's point was not, I take it, that nominalism was refuted by the stone's falling, but that it was refuted if, as he took it he and his audience both believed, it is predictable in advance that the stone will fall.

How so? The nub of the argument is, as I understand it, somewhat as follows. If, when we classify these and those things together as stones, as men, as horses, etc., we are bringing together in the extension of our general term things which *really are of a kind* independently of our thought or our linguistic conventions, then the expectation is justified that a so-far-untested thing of a certain kind will behave in the same way as already observed things of that kind. If, on the other hand, when we classify these and those things together as stones, as men, as horses, etc., our classifications are merely conventional, corresponding to no real

no real kinds in the world, there could be no justification for the expectation that, like stones dropped in the past, this stone will fall, or that, like horses already observed, this horse will not take to the air and fly, and so on. If there were no real generals, no kinds of things other than those created by our classifying them together, prediction would be impossible. This is pretty explicit in Peirce's explanation of Thirdness in the Lowell lectures of 1903:

. . . a prediction is essentially of a general nature . . . To say that a prediction has a decided tendency to be fulfilled, is to say that the future events are in a measure really governed by a law. . . "Oh," but say the nominalists, "this general law is nothing but a mere word or couple of words!" I reply, "Nobody ever dreamed of denying that what is general is of the nature of a general sign; but the question is whether future events will conform to it or not. If they will, your adjective "mere" seems to be ill-placed." . . . [T]he mode of being which *consists* in the fact that future facts of Secondness will take on a determinate general character, I call a Thirdness. (1.26)

The argument about explanation would run, I take it, somewhat as follows. What we perceive are particular things and events; but our perceptual judgements, since they predicate some general term of a particular object or event, already involve an element of generality. If our predicates correspond to real kinds in the world, classify together things which really are of a kind, it is possible for us to come up with abductive hypotheses about how things of certain kinds characteristically behave which, if true, would explain particular events by fitting them into a pattern of lawful generalization. But if there are no real kinds, if our classifications are merely conventional, the most that would be possible would be compendious descriptions of this, that and the other particular event—descriptions which would explain nothing, since there would be no underlying pattern into which descriptions of

particulars could be fitted. As Peirce wrote in the context of a critique of Leibniz's doctrine of pre-established harmony:

. . . nominalistic explanations . . . merely restate the fact to be explained under another aspect; or, if they add anything to it, add only something from which no definite consequences can be deduced. A scientific explanation ought to consist in the assertion of some positive matter of fact, other than the fact to be explained, but from which this fact necessarily follows; and if the explanation be hypothetical, the proof of it lies in the experimental verification of predictions deduced from it . . . (6.273, c.1893)

The intimate connections Peirce made among the notions of natural law, explanation and prediction are particularly clear in his discussion of Hume. On his, realist, conception, he suggests, a law of nature could be defined as "a foreknowing generalization of observations." The nominalist conception of a law as a bare regularity, by contrast, can explain neither how prediction nor how explanation is possible:

. . . the Ockhamists are forced to say of a law of nature that it is a similarity between phenomena, which similarity consists in the fact that somebody *thinks* the phenomena similar. But when they are asked why future phenomena conform to the law, they are apt to evade the question as long as they can.

The objection to Hume's conception of a Law of Nature is that it supposes the universe to be utterly unintelligible, while, in truth, the only warrant for any hypothesis must be that it renders phenomena intelligible. ("The Laws of Nature and Hume's Argument Against Miracles," 1901)¹⁵

The argument about induction is, I take it, that inductive generalization from observed instances to unobserved, or to an entire

class, is reliable if, but only if, the class concerned is of things which really are of a kind. If scholastic realism is true, therefore, valid inductions are possible; but not if nominalism were true, if there were no kinds except those created by our thought or language. As Peirce observed in a discussion of J.S. Mill, it is true that "the validity of induction depends on a uniformity;" but only if "uniformity" is understood realistically, as "law" or "real general." On Mill's nominalistic interpretation, however:

. . . the facts are, in themselves, entirely disconnected, and . . . it is the mind alone which unites them. One stone dropping to the earth has no real connection with another stone dropping to the earth . . . This theory of uniformities, far from helping to establish the validity of induction, would be, if consistently admitted, an insuperable objection to such validity. For if two facts, A and B, are entirely independent in their real nature, then the truth of B cannot follow, either necessarily or probably, from the truth of A. (6.99, 1902)

Genuine laws—"foreknowing generalizations"—differ from "mere" uniformities or accidental generalizations in applying not only to all actual, but to all possible instances, in saying not just what does happen when . . ., but what would happen if A real general is, as Peirce put it, a habit or would-be:

. . . The *will be's*, the *actually-is's* and the *have-been's* are not the sum of the reals There are besides *would be's* and *can-be's* that are real. (8.216, 1910)

I should stress that, as I understand it, Peirce's position was not that the success of the science of his time showed that scholastic realism is true, but that *the possibility of there being genuine science at all* required that there be real generals. Without real generals, explanation, prediction, induction would all be impossible; without explanation, prediction, induction, genuine science would be impossible. Peirce's position is thoroughly fallibilist; he allowed

that the supposed laws accepted by scientists at any given time might turn out not to be genuine, that the supposed real kinds they posited might turn out not to be real after all. Which generals are real is a matter which would only be finally settled in a hypothetical completed science. No doubt Peirce thought that the science of his time had in fact found some real generals: "A man must be downright crazy," he commented, "to deny that science has made many true discoveries" (5.172, 1903); human beings, he suggested, are able to make good abductions because they have "a natural adaptation to imagining correct theories" (5.591, 1903). His view, as I understand it, was something like this: that the science of his day, though thoroughly fallible and incomplete, had had some success, success partly explicable in evolutionary terms; that this constituted grounds for supposing that genuine scientific explanation, etc. is indeed possible; that the possibility of genuine science requires the truth of scholastic realism; and that the real generals are those that would figure in the laws—some of them already known—which would be accepted in a hypothetical completed science.

If this is on the right lines, it is scarcely surprising that Peirce should have claimed that pragmatism "could hardly have entered a head that was not already convinced that there are real generals" (5.503, c.1905), and that he referred to its "strenuous insistence on the truth of scholastic realism" as another of the distinguishing features of pragmatism (5.423, 1905). If science is possible only if scholastic realism is true, then scientific metaphysics, which uses the method of science, is possible only if scholastic realism is true; and pragmatism, which allows the legitimacy of a purified, scientific philosophy, is also possible only if scholastic realism is true.

Peirce criticized James's and Schiller's versions of the pragmatic maxim as nominalist in character. And, as is well known, he came to feel the same way about his own earlier formulation of the maxim, which gave the meaning of a general term by way of an indicative conditional specifying its *actual* experiential conse-

quences, and shifted to a distinctively realist formulation using a subjunctive conditional specifying the actual *and potential* experiential consequences. In 1878 he had claimed that "[t]here is absolutely no difference between a hard thing and a soft as long as they are not brought to the test" (5.403); but by 1905 he accused his earlier self of having "inclined too much towards nominalism" in suggesting that a diamond which is never rubbed is not really hard. This, he wrote, had been "a monstrous perversion of the concept . . . *real*" (5.457, 1905). In this context, it is worth observing, he associated the real hardness of the never-to-be-rubbed diamond with its physico-chemical composition, the "high polymerization of the molecule," from which its other properties are inseparable, and which it shares with all diamonds.

Another strand in Peirce's writing connects scholastic realism with his account of truth. When he first "declared for realism" in his review of Fraser's edition of the works of Berkeley (8.7ff, 1981), Peirce associated scholastic realism very closely with his characterization of truth as the opinion on which users of the scientific method would agree if inquiry were pursued long enough. A key element in Peirce's argument here seems to be the thought that only if there are real generals may it be supposed that, if it continued long enough, scientific inquiry would eventually reach a final opinion, a "catholic consent" (8.13). If scholastic realism is true, there is a pattern of similarities and lawful connections underlying and explaining the particular facts and events we perceive, a real pattern "independent of what you, or I, or any number of men think" (8.13). And so, though there is an "arbitrary, accidental element" in inquiry introduced by the peculiar circumstances and idiosyncrasies of individual inquirers, as inquiry proceeds this element could be expected gradually to be discarded, and the real pattern would, if inquiry went on long enough, emerge. Peirce's example of a blind man and a deaf man witnessing the same murder¹⁶ indicates that it is because he conceived of science as a social rather than an individual enterprise that he thought it could be expected eventually to eliminate the idiosyn-

cratic, the unreal. But if nominalism were true, if kinds of things were no more than artifacts of our thought, there could be no filtering out of what is real from what is arbitrary, accidental, dependent on how we think it to be. If this interpretation is on the right lines, Peirce took scholastic realism to be a necessary presupposition of his account of truth.

Another significant component of Peirce's argument in this review is his insistence that, though the real is independent of how we think it to be, it is not incognizable. As I read this very complex and sometimes quite puzzling paper, Peirce was concerned to distinguish scholastic realism not only from nominalism but also from what one might call "noumenism," the idea that the really real is in principle inaccessible to human cognition. This is why Peirce described his position as "highly favorable to a belief in external realities," but as "deny[ing] that there is any reality which is absolutely incognizable in itself, so that it cannot be taken into the mind" (8.13). This is characteristically pragmatist; for the pragmatic maxim would disqualify as not genuine any question which would not be susceptible of settlement however long scientific inquiry were to continue. In view of this it seems reasonable to conjecture that Peirce had in mind that scholastic realism is not only a necessary condition of his account of truth, but also, in conjunction with the pragmatic maxim, sufficient.

II

Though this has been quite far from a complete account of the ramifications of Peirce's defense of scholastic realism, it may, I hope, serve as a starting point to indicate why, as I believe, Peirce's arguments are quite directly relevant to, and throw some welcome light on, some contemporary issues in philosophy of science.

Since what I want to do is, in effect, to look at some modern philosophy of science through Peirce's eyes, a necessary preliminary is to observe that the question of nominalism and realism is not nowadays usually conceptualized in the way Peirce presented

it. Peirce's characterization is: whether laws and general types are figments of the mind or are real; a modern characterization is more likely to be along the lines of: whether an ontology of abstract objects is acceptable. This is not just a slightly awkward obstacle in the way of a straightforward presentation; it is also intimately connected with the diagnostic conjecture which informs my comparative remarks: that some contemporary work proceeds as if on the unstated assumption that, as Peirce might have put it, nominalism and nominalistic platonism exhaust the alternatives.

So: the idea is to look at some contemporary work from the perspective of Peirce's characterization of the issues. It seems to me that Peirce's suggestion that it is scholastic realism, the reality of laws and general types, which justifies the expectation that as science revises and replaces old by newer postulated classifications and laws it would, if it continued long enough, arrive at classifications and laws from which the local and idiosyncratic, the unreal, had been eliminated, has very striking resonances for contemporary debates. Peirce would have felt, I conjecture, that the picture favoured by Kuhnians of new categories and concepts replacing older, incommensurable schemes of classification as new paradigms gain the ascendant over older, incommensurable paradigms, conceals a covert commitment to nominalism.¹⁸ And Rorty's repudiation of "the world," as the supposed contrast to "our conceptions of how the world is," like the textualism of the recent French and German philosophy which Rorty admires, might have seemed to Peirce to reveal an overt celebration of nominalism.¹⁹

Or consider, perhaps most striking of all, the work of Goodman. Goodman, of course, proclaims himself a stalwart supporter of nominalism in virtue of his refusal to countenance classes. It is not this, however, which makes him so paradigmatic a nominalist from a Peircean perspective. It is rather, first, his suggestion that the difference between projectible predicates like "green" and non-projectible predicates like "grue" is a matter of entrenchment, that is to say an historical, and entirely conventional, matter; and, second, the irrealism of his picture of human cognitive

endeavour as creating a plethora of incommensurable, man-made "worlds," in which it makes no sense to ask which represents *the* world, or which cuts *the* world at the joints.²⁰

If Peirce was right in holding that nominalism is inherently inhospitable to the scientific endeavour, it is no accident that such overtly or covertly nominalistic pictures are sometimes presented by their supporters, or perceived by their critics, as overtly or covertly hostile to the acknowledgement of science as in any sense a distinguished cognitive enterprise. Goodman, though indeed he claims that his kind of pluralism "accepts the sciences," as he puts it, "at full value," treats artistic depictions and scientific descriptions on a par,²¹ and Rorty would align philosophy rather with the literary, or with "culture criticism," than with the scientific.²² Rorty, of course, presents himself as a neo-pragmatist; I hope it will be obvious why I say that his position, though it has certain affinities with James's, and even closer affinities with Schiller's, nominalistic pragmatism, is radically unlike Peirce's realistic pragmatism.²³ And Goodman, too, seems to me in some ways close to James, perhaps even closer to Schiller, but very far from Peirce.

In some cases the "realist" alternative to these kinds of picture is quite manifestly in the spirit of what Peirce would have called "nominalistic platonism." One thinks, for example, of the possible-worlds realism of a writer like D.K. Lewis, according to whom the intelligibility of subjective conditionals requires the existence of abstract particulars in the form of possible worlds and their possible inhabitants.²⁴ Of particular interest to me, however, are two philosophers who come quite close to scholastic realism, but on whom nominalistic platonism evidently still exerts quite a powerful attraction.

Skagestad suggests that the "empirical realism" defended by Putnam in *Meaning and the Moral Sciences* closely resembles Peirce's position.²⁵ There is an element of truth in this; most importantly, because Putnam's empirical realism concedes—though almost in passing—the *bona fides* of natural kinds. But the resem-

blance between Peirce and Putnam is not, I think, nearly as close as Skagestad supposes. For one thing, Putnam's position seems not to be so thoroughly fallibilistic as Peirce's; though his empirical realism is presented as an explanatory empirical hypothesis, rather as Peirce's was intended as an abductive hypothesis of scientific metaphysics, Putnam seems to offer his realist hypothesis to explain, not just the *possibility*, but, in a certain sense, the *success* of science—its "convergence," as he puts it.²⁶ For another, Putnam's defense of his empirical realism appeals to the "new theory of reference," or rather to his specific variant of anti-Fregean semantics according to which scientific terms are not synonymous with descriptions but are instead namelike, covertly indexical; their reference is determined not as: whatever has all, or enough, of the properties which constitute the sense of the term, but as: whatever is of the same kind as *that*—where *that* is some paradigmatic sample.²⁷ By contrast, Peirce's scholastic realism is not appropriately regarded, in the sense that Putnam's empirical realism is, as essentially or primarily a linguistic hypothesis²⁸—recall his objections to the Scotists' assumption that that availability of a term guaranteed the reality of a general. And there is in any case reason to doubt that Peirce would have sympathized with the construal of natural kind terms as like proper names; indeed, I conjecture that he would, on the contrary, have regarded the assimilation of natural kind predicates to proper names as symptomatic of a regrettable tendency towards nominalistic platonism. Though he often commented that the terminology was unfortunate, Peirce seems to have accepted a distinction between denotation and connotation; he agreed with J.S. Mill that proper names have denotation but not connotation, and even envisaged extending this thesis to certain peculiar nouns like "yard" and "metre;" but there is no reason to suppose that he favoured extending it to common nouns generally—indeed in one passage he remarked that "class terms" connote certain characters and denote whatever possesses those characters.²⁹ Matters are somewhat complicated by the fact that Putnam's account of natural kind terms is not really

quite so close to Kripke's as he sometimes suggests; although like Kripke he denies that natural kind terms are synonymous with descriptions, unlike Kripke he does not deny that they have meaning at all.³⁰ But there seems to be no more reason to think that Peirce would have sympathized with the idea that common nouns are covertly indexical than there is to suppose that he anticipated the idea that natural kind terms are rigid designators.

Perhaps the least straightforward point that has to be considered when one asks in what ways Putnam's empirical realism is like, and in what ways it is unlike, Peirce's scholastic realism concerns what Putnam calls the convergence of science. Putnam's indexical account seems to have been intended to underpin the thesis that, as science proceeds, there is, at least usually, continuity of reference of its theoretical terms, and thus to avoid the discontinuity threatened by a Kuhnian or Feyerabendian picture of meaning-variance and incommensurability.³¹ Peirce's account seems least misleadingly described as oblique to this. The pragmatic maxim encourages the idea that meanings grow as science proceeds: "How much more the word *electricity* means now than it did in the days of Franklin; how much more the term planet means now than it did in the time [of] Hipparchus," Peirce remarked; "[t]hese words have acquired information" (7.587, c.1867). This growth of meaning doesn't, of course, guarantee continuity of reference; and Peirce acknowledged (2.150, 1902) that the history of science has sometimes been more cataclysmic than cumulative. He went on, however, to observe that, in view of "how very, very little science we have attained, and how infantile the history of science still is," one should not infer that this will be the permanent pattern of the future, nor despair of the possibility of "attaining a knowledge of the truth by reasoning." Peirce would not have sympathized with Kuhn or Feyerabend much more than Putnam does; but he would not have sympathized, either, with the idea that it is necessary or desirable to resort to nominalistic platonism to avoid a picture of inevitable discontinuity and permanent revolution.

The "scientific realism" defended by Armstrong comes somewhat closer to Peirce's scholastic realism. Armstrong acknowledges universals as "independent of the mind;" furthermore, he holds that what universals there are is a matter for scientific discovery, and sees this *a posteriori* realism as playing a key role in the explanation of the notions of causation and of nomic connection. For all that, however, Armstrong's account seems to retain a whiff of nominalism—though, in virtue of his insistence that universals are *in* particulars, it might be better characterized as "nominalistic aristotelianism" than as "nominalistic platonism;" he always writes of universals as "entities," and as "existing."³² One should not be confused by the fact that Armstrong explicitly presents himself as opposed to what he calls "particularism;" because what he means by this is not that he rejects the idea that universals are existing entities, but that he rejects the idea that there is a numerically distinct, particularized universal in each individual thing of a given kind.³³ (And neither, of course, should one be misled by the fact that, extraordinarily enough, Armstrong classifies Peirce as a particularist in this sense.)³⁴

Ironically enough, the contemporary writer who seems to me to come closest to the spirit of Peircean scholastic realism is W.V. Quine. The irony, as I see it, is not that Quine is also an eloquent advocate of ontological austerity and a persistent critic of platonism, aristotelian essentialism, possible-worlds realism and the like; for Peircean realism, as I understand it, need offer no offense to these Quinean scruples. The irony is, rather, that Quine himself apparently fears that it might, and that, in consequence, he presents the realist elements in his philosophy in an ambivalent, equivocal manner, and heavily overlaid by nominalistic sentiments. I am tempted to say of Quine, as Peirce said of Scotus, that his is a "halting" realism, "separated from nominalism only by a hair." In consequence, I'm afraid, my discussion of Quine will inevitably be somewhat convoluted, as I try to disentangle the realist strands from their nominalistic overlay.

It is worthwhile to begin by noting the affinities between

Quine's conception of philosophy as continuous with science,³⁵ and Peirce's advocacy of "scientific metaphysics;" and between Quine's doctrine of posits and Peirce's construal of nominalism and realism as rival abductive hypotheses. It is also worth noting that Quine, like Peirce, acknowledges that Ockham's razor *prima facie* favours nominalism over less austere ontologies, and that, like Peirce, he initially sympathised with nominalism, but subsequently became convinced that it is *too* austere to be adequate for science. Quine remains scrupulous, ontologically speaking, but latterly the scruples are rather extensionalist than purely nominalist.

However, it needs to be observed that Quine's conception of nominalism is not quite the same as Peirce's: for one thing, Quine treats nominalism and conceptualism as interestingly different; for another, Quine conceives of nominalism primarily as a matter of a refusal to countenance abstract entities.³⁸ The latter point is important, because it is symptomatic of the fact that Quine's criterion of ontological commitment—"to be is to be the value of a variable"—makes it natural for him to think of nominalistic platonism as the alternative to nominalism. Quine's criterion locates ontological commitment in the bound variables of a theory; it is supported by his insistence on the objectual reading of the existential quantifier as "there exists at least one object such that" Given this criterion of ontological commitment and this interpretation of the quantifier, it follows that the employment of second-order quantifiers, such as " $(EF) (. . . F . . .)$," would commit one to the existence of properties, to properties as existent, abstract entities. In order to avoid this Quine shuns second-order quantification and treats the " F ," " G ," etc., of first-order predicate calculus not as genuine variables but as "schematic letters."³⁹ For all Quine's official hostility to multiplying senses of "to be," (perhaps attributable to his reasonable enough objections to some notorious excesses of Meinong's?) it would not be altogether misleading to think of Quine's distinction between genuine variables and schematic letters as mirroring, in the formal

mode, Peirce's distinction between existence and reality.

It would not be altogether misleading, but it would not be the whole story, or the most important part. The most intriguing part concerns what Quine has to say about natural kinds;⁴⁰ for it is here that he seems to escape the dichotomy of nominalism *versus* nominalistic platonism, and to come closest to scholastic realism. Quine sees the notion of natural kind as connected with a whole network of metascientific concepts: similarity, projectibility of predicates, induction, confirmation, lawlikeness, dispositions, subjunctive conditionals, causal statements. According to Quine, these notions hang together approximately as follows. Two things count as *similar* if they belong to the same *natural kind*. Natural kind predicates are the ones which are *projectible*, i.e., on which *inductions* can be made, and such that their positive instances *confirm* generalizations. Those generalizations are *lawlike* which are, or are logically equivalent to, generalizations in terms of projectible, natural kind, predicates. *Disposition statements*, or the corresponding *subjunctive conditionals*, can be construed as saying of a thing that it is of the same kind as things which have manifested or will manifest the disposition in question. *Bona fide* statements of *causation* are those couched in terms of natural kind predicates. And so on. The notion of natural kind, Quine comments, seems to be crucial to science.

Quine's picture of the interconnections among the concepts of natural kind, projectibility, induction, confirmation, lawlikeness, etc., is strikingly like Peirce's of the interconnections among the notions of real general, law, explanation, prediction, induction, etc. The similarity goes further; for, again like Peirce, Quine sets this picture against the background of a dynamic, fallibilist conception of science, and in the context of an acknowledgment of the epistemic significance of evolution. Human beings, Quine suggests, have innately a sense of comparative similarity, a sense which—since it is "presumably an evolutionary product of natural selection"—approximately corresponds to the real similarities in nature, but which does not fit those similarities perfectly. As sci-

ence develops, it modifies and sophisticates these primitive similarity standards. Some piecemeal refinements are already familiar: whales and dolphins get excluded from a more sophisticated, scientific concept of fish; solubility in water gets explained in terms of chemical microstructure, and so on. It is instructive to juxtapose Quine's comment that:

Things are similar in the . . . theoretical sense to the degree that they are interchangeable parts of the cosmic machine revealed by science.⁴¹

with Peirce's characterization of "real kind:"

Any class which, in addition to its defining character, has another which is of permanent interest and is common and peculiar to its members, is destined to be conserved in that ultimate conception of the universe at which we aim, and is accordingly to be called "real." (6.384, 1901)

But doesn't Quine regard the notion of natural kind with suspicion, believing that it is bound to resist explication in acceptably extensionalist terms? And doesn't he suggest that, as science proceeds, talk of similarity or natural kinds will, where it is respectable, be seen to be superfluous as it is found to be replaceable by talk of specific microstructural identities? Indeed he does. In fact, as he contemplates the prospect that promissory notes in terms of natural kinds will turn out to be redeemable against the hard cash of specifiable identities of microstructure, Quine seems increasingly to stress the superfluity of the notion of natural kind and to downplay its respectability—so much so that by the last paragraph of "Natural Kinds" he is rejoicing in the thought that the similarity notion will "disappear" when science is complete. Does this mean that it is wrong to represent Quine as acknowledging that there are real generals, kinds of things independent of our thought and language? Not necessarily. For things which are identical in microstructure are, surely, independent of us, alike. (It is apparent from his discussion of the high polymerization of the

molecule of the diamond, which means that, even if it would never be rubbed, it would be, like all diamonds, really hard, that Peirce was entirely clear on this point.) In a hypothetical completed science in which all talk of unspecified similarities was replaced by reference to specified identities of microstructure, the similarity *locution* might have disappeared, but *similarities* would remain. Quine does not make this distinction explicitly, and his evident satisfaction in the thought of the elimination of the similarity locution could easily convey the impression that he supposes that a completed science would not admit real similarities; but this nominalistic conclusion not only does not follow, but also would undermine a key argument of the paper. Human beings manage to make successful inductions as often as they do, Quine suggests, because our innate quality spacings correspond at least approximately to the real natural kinds; and this approximate correspondence can be explained in evolutionary terms: creatures whose innate quality spacings were too much at odds with the real similarities would not have survived. This argument obviously requires the acknowledgement of real similarities.

Nevertheless, it would not be appropriate to describe Quine as straightforwardly or unambiguously committed to scholastic realism. It is not entirely clear that he is aware, or fully aware, that his argument for the eliminability of the similarity locution is not *eo ipso* an argument for the elimination of real similarities; and consequently it is not entirely clear, either, that it would not better accord with Quine's intentions to read him as presenting, in the first half of "Natural Kinds," a realist picture which in the second half he argues we can, after all, do without. And though the realist interpretation is required by Quine's evolutionary explanation of the success of induction, the nominalist interpretation does a better job of squaring "Natural Kinds" with those other papers ("Necessary Truth" and even more strikingly Quine's reply to Parsons in the Hahn-Schilpp volume⁴²) where Quine seems to side decisively with the Humean conception of natural laws as mere regularities—for then the suggestion, in the early part of

"Natural Kinds," that a lawlike generalization is one which is logically equivalent to some generalization using only projectible, i.e., natural kind, predicates is not, after all, to be taken seriously as a repudiation of the nominalist conception. Though there is, in other words, undeniably an element of scholastic realism in Quine's writings, it is so overlaid and hedged about by nominalistic predilections that Quine's commitment to it must be judged equivocal and blurred.

As I said at the outset, I find myself of late more and more inclined to sympathise both with Peirce's conviction of the importance of the question of nominalism and realism, and with the "extreme scholastic realism" which he thought an adequate philosophy of science required. By way of redeeming my—perhaps foolhardy—undertaking to comment on its relevance to philosophy of science today, then, I want to try, by way of conclusion, to articulate something of what seems to me attractive about "extreme scholastic realism." Paradoxically, part of what I find appealing about it is its modesty. (Perhaps this isn't quite so paradoxical as it sounds; for one thing, I think there may be an element of self-mockery in Peirce's description of himself as "a scholastic realist of a somewhat extreme stripe;" for another, I gather that the closest medieval analogue of his position seems to be the "indifferentism"—"in-differentism"—which William of Champeaux proposed by way of response to Abelard's criticisms of his earlier "exaggerated realism.")⁴³

In describing it as modest, anyway, I want to draw attention to the fact that "extreme scholastic realism" says only that there are real kinds, kinds not dependent on our linguistic conventions or schemes of classification—which is to say only that some particular things in the world really are like each other, whether or not we classify them together. This is not to say that all our classifications correspond to real kinds of things; and neither is it to deny that some of our classifications are entirely conventional. (We classify certain stars together as the Southern Cross; the Bushmen,

apparently, combine these with other stars in the vicinity and call them "the Giraffe.")⁴⁴ But if scholastic realism is true, it is possible for there to be classifications which are not entirely conventional, but represent real kinds.

If Peirce was right, that this is possible is a necessary presupposition of the scientific endeavour. A full and detailed defense of this claim would require a better understanding of what makes a class natural,⁴⁵ and a full and detailed account of the whole family of meta-scientific concepts—law, prediction, induction, explanation—which it proposes to ground by appeal to the reality of generals. To paint this detailed picture is not, regrettably, presently within my powers; I can offer only a very impressionistic, but I hope at least a vivid, picture, painted with the broadest of brushes.

In contemporary philosophy of science it sometimes seems as if we have the choice only of two alternatives, both of them unpalatable: on, so to speak, the left wing, a kind of cynical sociology repudiates the idea that science enjoys, in any sense, a distinguished epistemic status, and the defense of science can come to seem to depend on some sort of infallibilist, inflexible, rigid, right-wing realism. Of course, this is a false dichotomy, and the truth lies somewhere in between. But though this supposed dichotomy is false, its influence is not negligible (perhaps it partly explains Quine's ambivalence about the realist conception which, in "Natural Kinds," he presents so persuasively but holds, as it were, at arms' length). And though the truth obviously—or so it seems to me—lies in between, spelling out exactly *where* in between is no trivial task. Part of what is appealing about Peirce's realist thesis, that laws and general types are not figments of the mind but are real, is that it goes far enough to avoid the first unpalatable alternative, but not nearly so far as the second. If laws and general types were not real, but were figments of the mind, science would indeed be (to borrow a phrase of Quine's) entirely "a put-up job;" and it is hard to see how one could defend even the modest idea that, whether or not it succeeds, science legitimately aspires to find out how things are. If laws and general

types are real, however, there is something for science to aspire to discover, something for the classifications we devise and the laws we postulate to get right or to get wrong. This is sufficient to permit a modest defense of science against the critique of the nominalist party; and yet it is compatible with the fullest acknowledgement of the imperfection, incompleteness and fallibility of science—and seems to avoid the elaborate but flimsy apparatus (the existence of possible-but-not-actual worlds, the assimilation of predicates to proper names, "general particulars") of late-twentieth-century nominalistic platonism. And, as the connection in Peirce's philosophy between scholastic realism and scientific metaphysics reminds us, what is at stake here goes beyond the philosophy of science; at least for those of us who, like Peirce, see philosophy as a branch of inquiry different only in degree of generality and abstraction from scientific inquiry in the narrow sense.

When I first read Peirce, I was puzzled, even amused, by the ubiquity and passion of his criticisms of nominalism, and inclined to regard his allegiance to scholastic realism as quaint at best, downright unpragmatic at worst. Now I suspect that he may have been ahead of our times, as well as of his own.

NOTES

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1. *The Nation*, 30.11.1871, p. 355.
2. Unless otherwise indicated, references to Peirce will be to *Collected Papers*, eds. Hartshorne, C., Weiss, P. and Burks, A., Harvard University Press, Cambridge, MA, 1931-58, by volume and paragraph number.
3. "From very early times, it has been the chief intellectual characteristic of the English to wish to effect everything by the plainest and most direct means, without unnecessary contrivance And, accordingly, British philosophers have always desired to weed out of philosophy all conceptions which could not be made perfectly definite and easily intelligible, and have shown strong nominalist tendencies since the time of Edward I., or even earlier." (8.10, 1871).
4. Peirce wrote in 1892 that he used to be "a little blinded by nominalistic prepossessions" (6.103). That he progressed from early nominalist sympathies towards a mature commitment to scholastic realism is documented, to my mind pretty persuasively, by Fisch, M., in "Peirce's Progress from Nominalism Towards Realism," *The Monist*, 11, 1967, 159-78 (but Roberts, D.D., "On Peirce's Realism," *Transactions of the Charles S. Peirce Society*, VI.2, 1970, 67-83, suggests that Peirce was a realist all along). On the shifts in Peirce's view of possibility, compare 3.442 (1896) with 3.527 (1897) and 6.367 (1902-3). On the shifts in his view of probability, compare 8.2 (1867) with 2.664 (1910). On the pragmatic maxim, see 5.453 (1905), and cf. pp. 29-30 above.
5. The accusation is made against Descartes at 5.63 (1902), 4.50 (1893); against Locke at 8.25 (1871) and 4.50 (1893); against Leibniz at 6.273 (c.1893) and 4.50 (1893); against J.S. Mill at 4.33 (1893) and 6.67 (1898); against Hegel at 8.258 (1904)—but cf. 4.50 (1893); against Fichte at 4.551 (1906); against Bain at 4.33 (1893); against Schiller at 8.258 (1904) and 8.326 (1906); against James at 8.258 (1904), and cf. Peirce's letter in Perry, R.B., *The Thought and Character of William James*, Atlantic, Little, Brown, Boston, MA, 1935, vol. II, p. 430, cited in Goudge, T., *The Thought of C.S. Peirce*, Toronto University Press, Toronto, 1950, p. 96 n.3 of Dover edition, New York, 1969.
6. The danger of nominalism in medicine, according to

Peirce, was that it encouraged the confusion of a disease with its symptoms. See 1.109 (c.1896).

7. Burks, A. in "Charles Sanders Peirce" in Fisch, M., ed., *Classic American Philosophers*, Appleton-Century Crofts, New York, 1951, 41-53, suggests that by pragmatic standards there is no difference between nominalism and realism. Goudge, in *The Thought of C.S. Peirce*, treats Peirce as, in effect, two philosophers: a pragmatist, and a transcendentalist who engages in metaphysical speculation of a kind the pragmatist would deem meaningless. Skagestad, in *The Road of Inquiry*, takes it for granted that Peirce's realism and his "verificationism" are at odds.

8. See e.g., 1.27ff (1903).

9. "Existence . . . is a special mode of reality," 6.349 (c.1901); cf. 6.495 (c.1906). But see Stearns, I., "The Apparent Amphiboly of Peirce's Reality," *Transactions of the Charles S. Peirce Society*, IV.2, 1968, 80-89, for a discussion of some ambiguities in Peirce's account of reality.

10. See 5.503 (c.1905); 5.470 (1903); 5.503 (c.1905).

11. This passage, like many others—e.g., 5.2, 5.6 (1902); 5.401 (1878)—indicates that the pragmatic maxim was intended as a criterion of meaning, and that Peirce intended to use it as the basis of a critique of traditional metaphysics. Admittedly, at 5.402 (1878) Peirce spoke of the pragmatic maxim as a rule for attaining the third degree of clearness, the grade beyond clearness-and-distinctness in the Cartesian sense; an observation which, taken in isolation, might be thought to suggest that the pragmatic maxim is not really a criterion of the meaningful, but only of a refined conception of clarity. My interpretation, however, would be that Peirce took only the third grade of clearness, the grade explained by the maxim, to guarantee the possession of a real conception or genuinely meaningful idea. This is supported by Peirce's expatiating, at 5.393 (1878), on the seductive dangers of ideas not of the third grade of clarity; and by the comment in the passage from 5.423 quoted in the text, that the availability of a verbal definition—of distinctness—is an insufficient guarantee of meaningfulness. But the pragmatic maxim characterizes meaning only in one sense of "meaning," and applies only to certain kinds of sign. At 5.475 (1905) Peirce explains that the maxim is

concerned, not with the "emotional" interpretant of a sign (the feeling produced by it), nor with its "energetic" interpretant (the action prompted by it), but with its "logical" interpretant (the change of habit induced by it). And at 5.8 (1902) Peirce writes that "pragmatism does not undertake to say in what the meanings of all signs consist, but merely to lay down a method of determining the meanings of intellectual concepts;" the maxim is intended to apply to general terms, but not to proper names (5.429, 1905).

12. 6.2 (1898).

13. At 1.20 (1903) and 5.423 (1905) Peirce attributes the insight that science is essentially realistic to F.E. Abbot, *Scientific Theism*, Little, Brown and Co. Boston, 1885 (but cf. O'Connor, D.D., "Peirce's Debt to F.E. Abbot," *Journal of the History of Ideas*, XXV, 1964, 543-64, for an argument that Peirce was overgenerous to Abbot, since he already recognised the realistic character of science before reading Abbot's book).

14. 5.93ff (1903).

15. In Wiener, P.P., *Charles S. Peirce: Selected Writings*, Dover, New York, 1966; the definition of a law as a "foreknowing generalization" is from p. 291, the first quotation from p. 295, and the second quotation from pp. 310-11.

16. The example reminds me irresistibly of the poem, "The Blind Men and the Elephant," in which one blind man, feeling the elephant's side, concludes that an elephant is like a wall, another, feeling its tusk, that it is like a spear, a third, feeling its ear, that it is like a fan, and so on. (The poem by John Godfrey Saxe, is to be found in *The Oxford Treasury of Children's Poems*, eds. Harrison, M. and Stuart-Clark, C., Oxford University Press, Oxford, 1988, pp. 116-7. Saxe draws rather a different moral than Peirce.)

17. This makes sense of at least much of the review; and can be reconciled with Peirce's claim that his position is "the phenomenalism of Kant" (8.14) if one recalls that elsewhere Peirce described himself as Kantian *but for his repudiation of the Ding an Sich* (see 5.452, 1905 and 5.525, c.1905). I note also that in this review Peirce seems to use the phrase "nominalistic platonism" to include the view I have called

"noumenism" (8.31); and that his opposition to noumenism shows that the notion of the real as "independent of thought" must be construed as "independent of how we think it to be," not as "possibly incognizable."

18. Kuhn, T.S., *The Structure of Scientific Revolutions*, Chicago University Press, Chicago, 1962; my reference to "Kuhnians" is intended to indicate that Kuhn himself is not quite unambiguously committed to the position described, though it is often attributed to him.

19. Rorty, R., "The World Well Lost," *Journal of Philosophy*, LXIX, 1972, 649-665, and in *The Consequences of Pragmatism*, Harvester, Hassocks, Sussex, 1982, 3-18.

20. Goodman, N., "A World of Individuals," in *Philosophy of Mathematics: Selected Readings*, eds. Putnam, H. and Benacerraf, P., Prentice-Hall, Englewood Cliffs, NJ, 1964, 197-210; "The New Riddle of Induction" in *Fact, Fiction and Forecast*, Bobbs-Merrill, Indianapolis, New York, Kansas City, 1965, 59-83; "Words, Works, Worlds," *Erkenntnis*, 9, 1975, and in *Ways of Worldmaking*, Harvester Press, Hassocks, Sussex, 1978, 1-22.

21. "Words, Works, Worlds," p. 4.

22. Rorty, *The Consequences of Pragmatism*, Introduction, especially section 5; contrast Peirce's observation: "As for that phrase "studying in a literary spirit" it is impossible to say how nauseating it is to any scientific man, yes even to the scientific linguist" (1.33, 1903).

23. See *The Consequences of Pragmatism*, Introduction, especially sections 1 and 2. Rorty tells me that the direct influence of Schiller on his work has been slight; I conjecture that Rorty reads James in much the same way Schiller did—or, as I should say, *misreads* him, taking his theory of "concrete truths" in isolation from his theory of "abstract truth." But that is another story.

24. Lewis, D.K., *Counterfactuals*, Blackwell's, Oxford, 1974, chapter 4. (As the title indicates, Lewis is concerned in particular with *counterfactual* subjunctive conditionals; it is worth noting that in a letter of 1913 (8.380) Peirce repudiated subjective conditionals with false, singular antecedents as not pragmatically meaningful.) Of course Peirce was in a sense a modal realist; not, however, of the nominalistic-platonist stripe of Lewis and other possible-worlds realists.

25. Skagestad, *The Road of Inquiry*, pp. 129-30, 138-9.

26. Putnam, H., *Meaning and the Moral Sciences*, Routledge and Kegan Paul, London, 1978, p. 20. Note Putnam's approving reference to Boyd's thesis that "the laws of a theory belonging to a mature science are typically approximately *true*."

27. Putnam, H., "Is Semantics Possible?" (1970) and "Meaning and Reference" (1973), both reprinted in Schwartz, S.P., ed., *Naming, Necessity and Natural Kinds*, Cornell University Press, Ithaca, NY, 1977, 102-18, and 119-32; "The Meaning of 'Meaning,'" in *Language, Mind and Reality*, Cambridge University Press, Cambridge, 1975, 215-71; *Meaning and The Moral Sciences*, pp. 22ff.

28. See for example 1.27, note 1 (1903): "Anybody may happen to opine that 'the' is a real English word; but that will not constitute him a realist. But if he thinks that, whether the word 'hard' itself be real or not, the property, the character, the predicate *hardness*, is not invented by men, as the word is, but is really and truly in the hard things, and is one in them all, as a description of habit, disposition or behavior, *then he is a realist*." Notice also how in the passage from 1.26 (1903) cited earlier, Peirce moved from describing the nominalist as holding that a general is "nothing but a mere *word*" to the realist's concession that the general is indeed "of the nature of a general *sign*," though not "mere." None of this, of course, is to deny that any ontological thesis can also be restated in the formal mode as a metalinguistic thesis.

29. For the distinction between denotation and connotation, see e.g., 1.559 (1867); 2.341 (c.1902); 2.939 (1867). Skagestad claims that Peirce rejected a Fregean type of sense-reference semantics, and that he was "fully cognizant" of the objection Russell was to make to Frege's distinction; but he cites no convincing evidence of this, and I have been unable to find any reference to Frege, or any relevant reference to Russell, in the *Collected Papers*. On proper names as having reference only, and the extension to "yard" and "metre," see 4.155 (c.1897). On class terms as connoting certain characters, see 2.341 (c.1895).

30. See "The Meaning of 'Meaning,'" and note that what Putnam says about himself and Kripke on p. 23 of *Meaning and the Moral Sciences* is that they agree *in denying that scientific terms are synonymy*

mons with descriptions.

31. Putnam, *Meaning and the Moral Sciences*, pp. 22-3.
32. Armstrong, D.M., *Universals and Scientific Realism*, 2 volumes, Cambridge University Press, Cambridge, 1978, especially the Introduction to volume I.
33. Armstrong, *Universals and Scientific Realism*, volume I, chapter 8.
34. Armstrong, *Universals and Scientific Realism*, volume I, p. 78. Ironically, Peirce objected to Scotus precisely with respect to the thesis that "universals are contracted to the mode of individuality in singulars" (8.208, c.1905).
35. See e.g., Quine, W.V., *Word and Object*, MIT Press, Cambridge, MA and London, 1960, pp. 3-4, 12, 22; "Epistemology Naturalized" in *Ontological Relativity*, Columbia University Press, New York and London, 1969, 69-90. I note that Quine sometimes sounds less as if he wants philosophy to use the methods of science and more as if he wants to repudiate philosophical problems in favour of problems soluble by the natural sciences; Peirce seems free of this kind of scientism. Cf. My "The Two Faces of Quine's Naturalism," forthcoming in *Synthese*.
36. Quine, W.V., "Posits and Reality" (1955) in *The Ways of Paradox*, Harvard University Press, Cambridge, MA and London, 1976, 246-54.
37. On Ockham's razor, and on the distinction between nominalism and conceptualism, see Quine, W.V., "On What There is," in *From a Logical Point of View*, Harper Torchbooks, 1953, 1-19 (reprinted in Putnam and Benacerraf, *Philosophy of Mathematics*).
38. See Quine, W.V. and Goodman, N., "Steps Towards a Constructive Nominalism," *Journal of Symbolic Logic*, 12, 1947, 105-23, which opens, "We don't believe in abstract objects."
39. See e.g., Quine, W.V., *Philosophy of Logic*, Prentice-Hall, Englewood Cliffs, NJ, 1970, pp. 24-5.
40. Quine, W.V., "Natural Kinds" in *Ontological Relativity*, 114-38 (reprinted in Schwartz, *Naming, Necessity and Natural Kinds*, 155-75—the editor's introduction, p. 34, describes Quine's position as

"scientific realism").

41. Quine, "Natural Kinds," p. 134.

42. Quine, W.V., "Necessary Truth" (1963) in *The Ways of Paradox*, 68-76; "Reply to Parsons" in *The Philosophy of W.V. Quine*, eds. Hahn, L. and Schilpp, P.A., Open Court, La Salle, IL, 1986—on p. 398 Quine repudiates the distinction between lawlike and accidental generalization outright.

43. I learned of these affinities from Barrett, D.C., "Indifferentism: a Strangely Modern Concept," paper delivered at the International Congress of Philosophy, Brighton, 1988. Of course, there *is* a sense in which Peirce's scholastic realism is extreme: it is further from nominalism than Scotus' position, since it repudiates the idea of the contraction of the universal in the particular; cf. note 34 above.

44. Van der Post, L., *A Story Like the Wind*, Penguin, Harmondsworth, Middlesex, 1974, p. 313. James uses a similar example (the Great Bear), but his nominalism encourages him to think of *all* categorisations as, like these, wholly conventional, not capable of corresponding, or failing to correspond, to real kinds.

45. I am reassured to see that Peirce seems to have been well aware of the kinds of difficulty which persuade Quine that the notion of natural kind will resist explication; but I am unable to judge whether Peirce's suggested characterization could be made acceptable. See 1.20ff (1902).

