A Priori Rules: Wittgenstein on the Normativity of Logic

Peter Railton

The University of Michigan

Introduction

Like many, I have long been uneasy with the category of the a priori. Perhaps I have simply misunderstood it. It has seemed to me, at any rate, that asserting a claim or principle as a priori is tantamount to claiming that we would be justified in ruling out alternatives in advance, no matter what the future course of experience might hold. Yet in my own case, I have felt it would be mere bluffing were I to lodge such a claim. I certainly could not discover in myself any sense of the requisite authority, nor even any clear idea of where to look for guidance in forming it.

Contemplating widely-used examples of "propositions true a priori" did not remove my worry. For a start, there was the shadow of history. A claim like "logical truth is a priori" or "the attribution of rationality is a priori in intentional explanation" kept sounding, to my ears, as if they echoed "the Euclidean geometry of space is a priori" or "the principle of sufficient reason is a priori in physical explanation". And these echoes awakened just sort of the worry that had initially unsettled me: I would pronouce myself satisfied that certain claims, at least, were safe from the threat of contrary experience, just on the eve of developments in our on-going view of the world that would lead a sensible person to want to reopen the question. So I would emerge looking like the (perhaps apocryphal) fellow who claimed, in the wake of the great inventions of the nineteenth century, that the US Patent Office could now be closed, since all the really new

ideas had been used up.

But where's the problem? After all, we often enough find ourselves in the wrong, sometimes embarrassingly so. Why should this impugn one particular class of knowledge claims? Indeed, isn't there something epistemically reassuring about the possibility of such embarrassment? Since we can hardly suppose that humans came onto the scene already fully equipped to comprehend the most intricate secrets of the world, if we were to find an utter fixedness of human thought or its categories throughout the history of inquiry, that would be rather too suggestive of a mental straightjacket. Of course, mere fluctuation of opinion or method, akin to the parade of styles seen in fashion, would hardly be reassuring. But if we instead see a pattern of conceptual change integrated with an active process of enlarging and diversifying the range of human experience and our capacity to predict and control natural phenomena ... -- well, this is what we would have hoped to see if we humans possess an adaptive intelligence hard at work.

So there's the problem: adaptiveness. The a priori is not as such just one more area of inquiry, like physics, mathematics, biology, or psychology, in all of which history leads us to expect significant conceptual change. Rather, it is a special standing in the process of inquiry, which precisely seems to rule out such change in advance. The distinctive content of a claim of apriority is not a matter of being right, or justified, or certain -- such claims can coherently be made a posteriori. To claim a priori standing for a proposition or principle, it would seem, is to commit oneself to an imperative: one is to treat all testimony of experience -- whether it be favorable or unfavorable to the way we currently think -- as bearing elsewhere on our scheme. When would one take it to be rational or justified, in advance of inquiry, to make such a commitment? And on what basis? Surely no mere feeling of certainty, or sense that one cannot

think of clear alternatives, would suffice.

One answer suggests itself. If some propositions or principles by their nature make no claims about the actual course of experience, then an a priori stance toward them would appear to require no peculiar insight or foresight on our part. Unfolding experience could neither confirm nor disconfirm them, simply because it would be irrelevant to them. We would be in a position to accord them a priori standing in virtue of possessing nothing more extraordinary than a grasp of their meaning or content. This answer should be especially encouraging for a philosopher suffering from epistemic anxiety. For although we philosophers do not carry out real experiments and can seldom strictly prove our conclusions, we do specialize in analyzing meaning and its implications. So we would seem to have the right sort of qualifications to make reasonable claims to a priori knowledge.

A Bayesian simulation of the a priori

However, one might wonder whether appeal to meaning could rescue the a priori if we, as philosophers, insist that meaning is the sort of thing susceptible to analytic methods. We might think that treating the a priori as a matter of issuing ourselves an epistemic imperative to treat experience as bearing elsewhere is the sort of thing that analysis could establish, since an analysis of meaning is supposed to tell us, among other things, what would or would not count as contributing to the verification or confirmation of a proposition. If our analysis shows that no experience could tend to verify or confirm (or refute or disconfirm) a proposition, then surely we are entitled to treat it as a priori, whether true or false.

Yet if we try to develop a model of this, it emerges that we might have committed ourselves to a much more substantive epistemic stance than we thought. Consider what I will call a Bayesian simulacrum of the a priori.

On an orthodox Bayesian scheme, rationality in belief consists in rigorously following Bayes' Rule to modify our existing degrees of belief, our prior probabilities, in the light of new evidence. Within this scheme, propositions identified as purely logical or purely analytic are automatically assigned prior probability 1 or 0 at the outset. This nicely simulates the feature of the a priori we have stressed: since the application of Bayes' Rule will never alter prior probabilities of 1 or 0, by following it we would always treat experience, whatever its character, as bearing elsewhere on our system of beliefs.

But now look what we have done to ourselves as inquirers. So long as we remain committed Bayesians in belief revision, never permitting ourselves any exceptions to the application of Bayes' Rule -- e.g., no "spontaneous" (not Rule-governed) reassignments of prior probabilities -- we will in effect treat these purported purely logical and analytic propositions (a supposition about their semantic character) as if our propositional attitude toward them were forever certain and unrevisable (an epistemic status). Any inquirer who introduced conceptual innovations or revisions that required "spontaneous" reallocation of prior probabilities -- say, who introduced the idea of the curvature of space, such that 'Two lines on a plane either intersect at one point or at none' goes from being assigned prior probability 1 to having no determinate prior probability (because an incomplete proposition) -- could not be following Bayes' Rule, and would have to be counted an epistemic outlaw, a violator of the demands of epistemic rationality. But suppose we have encountered persistent strains and paradoxes -- Kuhnian "anomalies"[1] -- in

applying our existing conceptual scheme. Mightn't the "outlaw" behavior of conceptual revision be more rational than an iron resolve never to depart from the iterated application of Bayes' Rule using the old predicate system (or conceptually conservative "logical constructions" therefrom)? Must we apply a mental straightjacket of our own making?

Now I might be accused of an elementary conflation of semantic or conceptual possibility with epistemic possibility, but I do understand a priori to be an epistemic category -- we cannot appeal directly to semantic or conceptual possibility to map out its boundaries. And the Bayesian simulacrum might or might not be a good model of what philosophers have had in mind in speaking of a priori knowledge, yet perhaps it it does help make vivid my concern. In our hearts, I think, we recognize that the particular conceptual scheme we inherit may not be adequate -- even via logical constructions -- to express the whole truth about the world, and so we want to license adverse experience to bring recognizably epistemic pressure to bear on us a posteriori for more or less radical conceptual innovation.

<center>Unrevisability</center>

There is another, more Kantian way of expressing this appropriate humility. If we suppose that somehow or other, thought must be adequate to the world -- perhaps because "the world" itself must be "thought" in order to have any role in inquiry and deliberation -- then we should recognize that we are thereby engaged in a substantive commitment, licensing us to make claims with existential import. If it is a priori, it is synthetic a priori. On the Bayesian simulacrum, the orthodox Rule-follower is in effect treating his scheme of thought as if it were

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adequate to the world. But unlike Kant, who admits that any such notion must be treated as a substantive postulate of reason, the Bayesian has adopted his synthetic a priori commitment solely on the strength of taking certain propositions as analytically true. The imperative to treat evidence as bearing elsewhere on our conceptual scheme thus turns out to be remarkably substantive. We run the risk, as Wittgenstein warns, that "We predicate of the thing what lies in the method of representing it" (PI 46).[2]

"But surely," it will be replied, "there are limits to conceptual revision. A priori knowledge is about those limits. Indeed, for there even to be such a thing as 'the bearing of experience on our belief scheme' there must be inferential connections within the scheme that are not simply up for grabs in experience. That is, logical relations are presupposed whenever we speak of 'adverse experience', of the 'incompatibility' of belief that p and observation that ~p."

There is something to this reply. Consider the case of "quantum logic", meant as a conceptual revision of "classical logic" rather than a special-purpose supplement to it. When quantum logicians ask us to revise our logical framework in light of the a posteriori "contradictions" or "anomalies" we have encountered in applying our existing conceptual scheme to quantum phenomena, we are entitled to raise an eyebrow. As Saul Kripke has observed, if quantum logicians use classical logic to derive the "contradictions" of our present scheme in fitting observation, and then go on to deploy a classical metalanguage to define new "quantum connectives" or rules of inference, and to "draw the implications", then we don't really have before us a proposal to revise our logic after all -- quantum logicians are simply assuming classical logic's good standing and universal applicability.[3] But if they do not do this, and instead formulate their evidence, introduce their new connectives or rules, and make their arguments

using inferences or definitions that <u>violate</u> our antecedently understood logic, then their proposals will simply be unintelligible to us, and present us with no motivation for change. Why, for example, should the fact that someone could use inferential rules we do not accept to derive what he calls "contradictions" in our present theories or beliefs have any tendency to convince us that we are in deep epistemic difficulty and need to be rescued by accepting some novel inferential scheme that we deem invalid? So the very idea of "revising our logic" begins to look fishy.

Should we now comfort ourselves that we have an <u>a priori</u> refutation of "alternative logics"? It might be well to bring the Bayesian simulacrum back to mind and ask exactly what we seem to have talked ourselves into. I myself have no idea how we arrived at our current understanding of "classical logic" and its rules, or whether a historian of logic would claim that our current understanding can properly be seen as a continuous extension of the understanding of logic that prevailed in (say) Aristotlean or pre-Aristotlean times. But somehow it seems to me unlikely that we will find an evolution of thought and language from prehistoric human verbal exchange to contemporary propositional logic, such that, at each step of the way, the earlier conceptual structure was definite and rich enough to express by some conservative extension the meanings or connections necessary for motivating and defining the later. "Classical logic" is not self-defining and self-interpreting, but rather must be introduced and interpreted using our background natural language as a metalanguage.

But what now prevents our general openness on the question of the expressive adequacy and epistemic standing of our current conceptual repertoire (or our self-understanding of it) from encompassing those very elements of our language with which we introduce and debate logical rules and constants? On-going controversies among mathematicians, logicians, and philosophers

over various parts of logic and their interpretation -- intuitionist logics, criteria of proof and computability, the boundary between logic proper and set theory or "strengthened" logic, etc. -- suggest that there are genuine "open questions" concerning which rules and constants to adopt as authoritative, even in logic. Yet we seem to have been able to construct and make much good use of the classical propositional calculus without resolving all these questions. As Wittgenstein noted:

> 120. When I talk about language (words, sentences, etc.) I must speak the language of every day. Is this language somehow too coarse and material for what we want to say? Then how is another one to be constructed? -- And how strange that we should be able to do anything at all with the one we have! [PI 49]

A priori rules

Once we recognize that if we treat classical logic as giving the limits of real possibility we are engaged in a substantive, synthetic commitment, should we then simply understand logic as a set of substantive, quasi-metaphysical claims about "the fundamental structure of the world" rather than merely formal, analytic truths? This might be more forthright, but perhaps another response would be better. After all, a set of substantive claims about the world sounds like a set of propositions, and to give an complete account of logic we need to encompass as well the notion of a rule of logic, and rules, unlike propositions, do not strictly speaking make claims capable of truth or falsity. Moreover, if our account is supposed to capture the purportedly a priori status of logic, then it must explain the notion of a rule with a priori standing.

Moreover, recently the thought has become current that meaning (or content) is normative,[4] since it guides but does not merely describe or predict use. The sense in which meaning is thought to govern or regulate use cannot be that in which we speak of a law of nature, say, as governing or regulating the movement of a particle. For if an individual particle is credibly observed to violate a law of nature, this tends to disconfirm the law, whereas it is quite compatible with an account of the meaning of a word or thought that there be uses that unquestionably violate it -- indeed, it is the use, not the meaning claim, that is deemed "incorrect". We could understand this if meanings were like rules for use rather than empirical generalizations about use. For rules can "hold" or be "in force" in those particular instances in which they are violated as well as those in which they are followed -- that is, indeed, something like their special office. And, if meaning, like logic, is a priori, then, again, we have encountered the notion of an a priori rule.

How are we to understand this notion? Most recent philosophical discussion of apriority with which I am familiar has focused on a priori (or a priori justifiable) propositions. Fortunately, we get a clue from the feature of rules just mentioned: rules can indicate, in advance of use, how we are to "go on", and yet their "holding" is compatible with our failing to go on in this way. This is a kind of a priori standing: unlike empirical generalizations, rules are not vulnerable to a posteriori disconfirmation by the occurrence of particular instances in which they are violated. By the same token, a rule is not confirmed a posteriori by instances of rule-conforming use: when, struggling, I manage to use a phrase correctly in French, this may somewhat enhance my credibility as a French-speaker, but it does not strengthen the credibility of the rules of French grammar. One might say that the very possibility of my use being either

correct or incorrect presupposes the "holding" of a relevant rule as a <u>condition</u>, and so my particular verbal (or mental) conduct can neither confirm nor disconfirm it.

A rule, then, can be thought of as <u>a priori</u> <u>regulative</u> of practice, in the sense just described. Could it, or our acknowledgement of it, also be spoken of as <u>a priori</u> <u>justified</u>? If rules do not owe their standing to something like confirmation by the course of experience, where does their standing come from? When is a rule genuine or applicable? This is not a question about how to establish the truth of 'This community believe that rule <u>R</u> holds', which presumably can be confirmed or disconfirmed in familiar <u>a posteriori</u> ways. Rather, it is a question about how to establish a genuinely regulative claim <u>that</u> rule <u>R</u> holds -- that usage in accord with <u>R</u> would be correct, not simply believed to be correct.

Can we deploy the notion of an <u>a priori</u> justified proposition to explain that of <u>a priori</u> justified regulative claim? Perhaps an <u>a priori</u> justified regulative claim could owe its special standing to the <u>a priori</u> justifiability of an "associated proposition". For example, the <u>a priori</u> status of logic could be defended on the grounds that the defintions of the logical constants determine that certain patterns of inference are valid. Thus, the Rule of the Excluded Middle might be deemed a justified <u>a priori</u> regulative claim concerning deductive inference since the "associated proposition", '<u>p</u> v ~<u>p</u>', is true in virtue of the definitions of 'v' and '~' alone. In the case of induction, Bayes' Rule might be deemed a justified <u>a priori</u> regulative claim concerning belief revision because the "associated proposition", Bayes' Theorem, is provable within the axioms of the probability calculus (which are said to "implicitly define" 'probability'), given a standard definition of conditional probability. To accept such an approach as explanatory, however, we would have to convince ourselves that it involves no circularity or regress.

Circularity threatens when we try to spell out what we mean by "true in virtue of the definitions alone": for we are bound to speak not just of definitions or stipulations, but of their logical consequences. Thus we will already have assume the a priori justified regulative standing of the rules of logic in accepting our explanation.

Regress threatens because of Lewis Carroll's "Achilles and the Tortoise" argument.[5] Suppose we were to say, "No, the rules do not hover outside or behind the inferences, they are themselves premises of it, always admissible because they are immediately true by definition or stipulation." Yet now the Tortoise patientlyl shows us that if we treat a rule of inference as an additional, propositional premise in an inference, we generate the need for another premise, and another, and ... . Rules seem to be distinctive in their function.

For example, orthodox Bayesians and non-Bayesians may be in full agreement that Bayes' Theorem is provably true, and they share a core understanding of 'probability' as "partially interpreted" by the Kolmogorov axioms. Moreover, they may accept the same definition of 'conditional probability', and agree that conditional probabilities bear precisely the structural relationship Bayes' Theorem displays. Yet one group deploys this relationship as a generalized regulative guide in belief revision and the other does not. What does this difference consist in? For the Bayesian, the Theorem gives a model or pattern for rational belief revision, an inductive principle or "rule of reason". Our degrees of credence, as they evolve in response to evidence, are to be "normed" to fit this pattern of conditional probabilities if they are to be rational. This claim is a priori in the sense discussed above: it specifies in advance of inquiry how we are to "go on" in response to new evidence, and those actual individuals who fail to go on in this way do not "disconfirm" Bayes' Rule, but only show a defect of rationality in their beliefs. By

contrast, Non-Bayesians need not treat the probabilistic relationship displayed in the Theorem as an a priori gauge of rationality in credence. For example, they might not think it a condition of rationality that one's beliefs be representable probabilistically, or "normed by" a probabilistic scheme. The Bayesian will of course dispute this, and claim that unless our beliefs are representable probabilistically, various ills may befall us -- such as the Dutch Book. But the non-Bayesian will counter that if we attempt to pattern our beliefs on classical probabilities various ills and rigorously norm them to Bayes' Theormem, various other ills may befall us -- as the Bayesian simulacrum suggests. This is a substantive debate about how to "go on" in belief, about which rules have rational authority in epistemology, if any. It is plainly not a dispute that is resolved even if we all settle upon the analytic or provable status of Bayes' Theorem.

Another example, drawn from the classic literature on the synthetic a priori, might help here. Consider the proposition of Universal Causality, "All events have sufficient cause", which is associated with the purported "rule of reason" known as the Principle of Sufficient Reason. This proposition receives increased a posteriori confirmation when we find sufficient cause for a previously unexplained type of event, and its degree of confirmation is correspondingly reduced to the extent that intense efforts to accomplish this continue to fail. On the other hand, in the Principle of Sufficient Reason, we treat Universal Causality as a pattern for guiding how to "go on" in rational inquiry, and so treat it as synthetic a priori. When a search for sufficient cause comes up short, as in various quantum-mechanical phenomena, we do not say the "rule of reason" is discredited, but that "We simply lack an adequate rational explanation of these phenomena", and thereby urge further inquiry or conceptual development to promote greater understanding. In effect, we withhold from irreducibly probabilistic accounts of these

phenomena the designation "explanation" or "full understanding", saying instead "We still do not understand the reason why this occurs as it does". Were we to depart from the Principle, and say, "No, we do have a complete understanding of this probabilistic phenomenon", this would amount to a partial abandonment of our commitment to rational empirical inquiry. Indeed, it might be thought to undermine not only our engagement as inquirers on behalf of giving "reasons why something occurred", but also do weaken our notion of giving "reasons for belief", since a fundamentally probabilistic law linking a system's state $\underline{S}$ with a subsequent outcome $\underline{O}$ is compatible with both the occurrence and the non-occurrence of $\underline{O}$ in any given instance.

By contrast, those who reject the Principle of Sufficient Reason as a rule of reason, may hold that quantum mechanics offers ample a posteriori evidence that Universal Causality is false, and that in a world including fundamental chance processes, we can be fully responsive to the reasons why things occur in the world and to the reasons for belief, only if we accept irreducibly probabilistic explanation and confirmation relations. For this group, there need be nothing at all "second class" or "imperfectly rational" about such relations, or our acceptance of them.

We have, then, a distinctive idea of what it is (at least in part) for a principle to function normatively in a practice: there is, in the sense illustrated above, an a priori commitment to the principle as affording a regulative standard of comparison to guide the practice.

Norma, regula, estandard of correctness

In a famous passage, Wittgenstein writes:

81.   F. P. Ramsey once emphasized in conversation with me that logic was a

'normative science'. I do not know exactly what he had in mind, but it was doubtless

closely related to what only dawned on me later: namely, that in philosophy we often

<u>compare</u> the use of words with games and calculi which have fixed rules ... . [<u>PI</u> 38]

Later, he treats this notion of comparison in a remarkably concrete way:

131. For we can avoid ineptness or emptiness in our assertions only by presenting the

model [e.g., a calculus with "fixed rules"] as what it is, an object of comparison -- as, so to speak,

a measuring-rod; not as preconceived idea to which reality <u>must</u> correspond. (The dogmatism

into which we fall so easily in doing philosophy.) [<u>PI</u> 50-51]

The nature of these epithets -- the inept, empty, dogmatic figure who cannot bring himself to

present things as what they really are, is a familiar object of public ridicule in drama --

encourages us to listen attentively to what Wittgenstein might be hinting at, and to prepare

ourselves to have certain fond pretensions deflated. To try to avoid the fate of this ridiculous

figure, who cannot see things for what they really are, let us try to stick to the concrete and

everyday. No fancy philosophical talk or dogma.

As it turns out, our talk of <u>rules</u>, of the <u>normative</u>, and of <u>standards of correctness</u>, for all

its seeming abstractness, has reassuringly concrete origins, indeed, just the sort of origin

Wittgenstein seems to have had in mind: the use of "objects of comparison" in guiding an

everyday practice.

'Rule' descends from <u>regula</u>, a ruler or straight-edge (compare Wittgenstein's <u>Masstab</u>,

translated in the passage above as 'measuring-rod', and elsewhere in the <u>Investigations</u> simply as

'ruler' [cf. <u>PI</u> 128]). 'Normative' and 'norm' descend from <u>norma</u>, a mason's or carpenter's square.

 'Standard' descends from <u>estandard</u>, a banner or device that served, e.g., in combat ("a battle

standard"), to help lead individuals in a common direction or otherwise direct and coordinate their movements. And 'correctness' descends from corrigere, which in turn derives from kom- + reg-, to bring into alignment with a straight line.[6] The regula, norma, and estandard are tools or devices used to accomplish vital purposes, such as making things, or movements, corrigere. Let us begin by looking into the builder's toolkit, where we find the ubiquitious norma and regula. How are they normally used, and why are the first tools acquired after the saw or chisel and hammer?

The mason or carpenter initially confront rough workpieces -- lumber or stone -- to be cut to size for their place in the construction to be made. Prior to making a cut, the workman places the norma or regula against a workpiece as a guide, and scribes a line for his cut to follow. He then cuts to the line, and afterwards reapplies the norma or regula to test the cut for squareness or straightness. If there are gaps between tool and workpiece, the cut will be "brought into line" or "corrected" (corrigere) using a saw, chisel, rasp, or plane, until the fit is tight. Only in Chaplin comedies will the norma or regula itself be "corrected" to match a crooked cut by filing away at the tool until it fits.

Thus, the typical role of the norma or regula in building is, like the role of rules discussed in the previous section, to be a priori regulative of the carpenter's or mason's practice. Prior to the cut, the norma or regula are used to indicate how to "go on", and if an actual cut fails to conform to the norma or regula, it is the cut that is corrected, not the tool. Thus the norma or regula are not vulnerable a posteriori to "disconfirmation" by actual practice that fails to conform, but neither are they "confirmed" by practice that does conform. Credit for beautifully square and straight cuts goes to the carpenter or mason, not the norma or regula as such.

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How does the notion of an <u>estandard</u> of correctness get into this process? If builders are working together on a construction site, or a worker or group of workers are preparing materials ahead of time for later assembly by themselves or others, how do they know that the pieces they make will fit together and fit well in the final assembly or construction? The various measuring tools in their individual toolkits guide them in making finished pieces that will fit together (other than by chance) unless they use the same tools, or replicas of a common pattern. Moreover, simply using replica measuring tools will not tell them that the fit will be good -- that the walls will be vertical and stable, the floors and building surfaces horizontal and smooth, the seams and corners tight -- unless these tools embody shapes with certain systematic characteristics and relations. They need, in short, each to have in their kits tools that can serve as <u>estandards</u> to provide common guidance to their cutting, and guidance that, if systematically followed, will enable them to create constructions that fit the characteristic needs of building. There might be multiple sorts of tool that could be replicated and distributed among carpenters and masons to have this effect, depending especially on the kind of building to be created. But surely one of the simplest and most practical solutions, given materials such as wood or stone, is the rectilinear one, and for this the <u>norma</u> and <u>regula</u> serve admirably as <u>estandards</u> of correctness (co-alignment). Each individual worker in the division of labor, or in a distribution of labor over time, will possess a reliable guide for "going on" in such a way that her contribution will fit the whole and play its role. So evident has this been to carpenters and masons through the ages, that their guilds and unions often feature the <u>norma</u> or <u>regula</u> on their banners.

So far we have spoken of <u>a priori</u> regulative uses of tools, akin to rules. What of the other side of the contrast, the <u>a posteriori</u> correctible empirical claim? Have builders no need for this?

Contrast another tool, the contour gauge. Looking like an oversized comb with teeth that can slide in or out, a contour gauge is pressed against a shape to record its profile. If a mason or carpenter applies a contour gauge to a surface and finds there are gaps, then it is the gauge that is to be "corrected", brought into alignment, not the surface. Depending upon the thickness of the teeth, the contour gauge can give a more or less faithful or fine-grained re-presentation of the original shape. Contour gauges are ordinarily equipped with a set-screw or friction device to lock the re-presentation of the profile into place. It can then be used to "communicate" a profile to ourselves in the future, or to others. Such a gauge can also be used, for example by an archaeologist documenting a ruin, by re-applying the recorded profile to other, similar surfaces to see how well it fits them, perhaps loosening the set screw slightly and readjusting the gauge to capture something like the average shape of the surfaces, taken together. Such uses of the gauge are a posteriori, as a more or less fine-grained empirical record or generalization. Alternatively, a builder may keep the contour gauge in active use, applying its "locked" profile to scribe unfinished workpieces and guide their shaping, such that the gauge now functions as an a priori estandard for a series of finished pieces in much the same way as a norma or regula. Unlike those tools, however, it enables the builder to replicate reliably complex, curved shapes that would fit neither norma nor regula. One can readily see why the carpenter's and mason's toolkits typically contain both rigid measuring tools like the norma or regula and adjustable measuring tools, like the contour gauge.

Of course, we must be careful not to invest the tools themselves with a magical power to regulate use. It is not the norma and regula themselves that prevent us from using them to replicate complex, curved shapes -- we always have it in our power to use such a tool in a

Chaplinesque manner, inefficiently but still effectively using it to record or transfer complex, curved shapes by carefully cutting and filling away at it until it faithfully conforms to their profiles. That the contour gauge typically is used in this way, and the norma and regula typically are not, is not something dictated by their inherent features, but rather decided by us, given their inherent features and our convenience and needs.

This is not to deny that the inherent features of a tool impose some limits on how it might effectively be used. The contour gauge can record the geometric profile of a shape, but its reading will not, except by accident, reliably represent differences in color, reflectivity, surface moisture, composing material, etc. The norma and regula, similarly, can be used to guide the shape of a cut, but not its speed or the choice of cutting tool. These relatively limited and form-related (formal) characteristics of such tools are at once their strength and their limitation. They can be used repeatedly, on materials of many kinds, by builders deploying a wide variety cutting techniques and tools for indefinitely many purposes. This is a dimension of (what one might call) generality of application. At the same time, they do not enable us to assess or control for many of variables relevant to construction, such as surface color, or strength and appropriateness of materials. They are not, then, all-purpose guides, despite their general usefulness as "standards of comparison". We must know when to use or follow them, for what purposes, and when not.

Wittgenstein writes:

430. "Put a ruler against this body; it does not say that the body is of such-and-such a length. Rather is it in itself -- I should like to say -- dead, and achieves nothing of what thought achieves." -- It is as if we had imagined that the essential thing about a

living man was the outward form. Then we made a block of wood in that form, and were abashed to see the stupid block, which hadn't even any similarity to a living being. ...

432. Every sign <u>by itself</u> seems dead. <u>What</u> gives it life? -- In use it is <u>alive</u>. Is life breathed into it then? Or is the <u>use</u> its life? [<u>PI</u> 128]

It is of particular importance for our purposes here that we notice what <u>norma</u>, <u>regula</u>, and contour gauges do not "say". Any tool in itself is mute, but in our hands, in a practice, it can be a guide or a record or a standard.

This does not represent these tools as possessing magical powers, but it does show something: though the <u>norma</u> and <u>regula</u> lack "inherent power" to guide, we nonetheless can by disciplining ourselves to use them as guides enlarge our powers, achieving, for example, a degree of precision and regularity, or of communicative and replicative accuracy, that unassisted we could not.

If they are not taken as all-purpose guides, are they therefore somehow "hypothetical" measures or standards? Hardly. A <u>norma</u> or <u>regula</u> affords, in use, a standard of squareness or straightness that is utterly indifferent to our particular purposes, interests, or wishes. The square or straight-edge is a demanding master indeed when one is working with a recalcitrant material -- and it knows of no concession in rigor to accommodate us. The <u>norma</u> and <u>regula</u> enable us to categorize cuts as square or straight, independently of our desires, and so are more properly seen as <u>categorical</u> than <u>hypothetical</u> standards.

Norma <u>and</u> Super-norma

Categoricalness needs, however, to be distinguished from <u>unconditionality</u> or <u>intrinsic action-guidingness</u>. The <u>norma</u> and <u>regula</u> can be used to tell us whether a workpiece meets a standard of squareness or straightness, even when it should not or need not be so. A wooden ship, for example, contains thousands of pieces of wood, almost none square and straight on all sides. Shipwrights make relatively little use of the <u>norma</u>, and certainly would never place it on their guild's or union's banner. And although firewood could without loss of functionality be nicely squared on its ends, this would be without particular point. So wood-cutters can rely on their hands and eyes to make their cuts roughly square, and do not go into the forest with <u>norma</u> in hand. Even a fine finish carpenter sets her <u>norma</u> aside when cutting the edges of spiral-stair treads.

So a <u>norma</u> or <u>regula</u> does not issue an unconditionally action-guiding command, "This is how the workpiece <u>ought</u> to be, or <u>ought</u> to be cut". No tool in the kit imposes such a command upon us. And a good thing, since, once taken up, it would leave us unfree to depart from its guidance (except perhaps through fatigue or weakness), and we would be guided as if by rails to follow it with or without a seconding judgment on our part. This sort of <u>super-norma</u> is not a good model of any familiar sort of <u>normative regulation</u>, but would be experienced more like the force of effective coercion or a trance. As Wittgenstein notes, when we follow rules in everyday life, it is not as if we had "at every step ... a feeling of being guided by the rules as by a spell" (<u>PI</u> 87). One might think at first that imperfect craftsmen like me could be made better builders or handymen if only one could put into their hands a <u>super-norma</u> that would not permit straying from the line or second-guessing of it. But the varying and sometimes unpredictable needs of building, as well as the continuing evolution of building materials and techniques, suggest that

we would in fact be poorer builders -- closer in capacity to machine tools that need external

reprogramming than adaptive general builders and effectively improvising handymen.[7]

A programmable computer might encounter the following sequence of unconditional

command lines:

(1) Display "I obey" on the screen and go to (2).

(2) Go to (1).

Once these commands were "understood" -- compiled and read in from memory -- they would be

executed competently, without condition, reluctance, or distraction. But also without point. The

computer would loop forever between (1) and (2), the screen displaying a neatly-arranged and

uninterrupted stream of "I obey"s, until the power fails or the circuits fry.

Well, perhaps our <u>super-norma</u> could anticipate all needs and situations, and all

innovations in building materials or techniques, and provide a strict general-purpose algorithm

that needs no judgment, interpretation, or improvisation for application? But if arithmetic is

undecidable, what chance is there for building? Better to recognize that we have no more idea of

what it would take to have an all-purpose <u>super-norma</u> for builders than, according to

Wittgenstein, we have an idea of how a meaning could give us a <u>super-rule</u> for the "whole use of

the word" in thought and language:

> 192. You have no model of this superlative fact, but you are seduced into using a
> super-expression. (It might be called a philosophical superlative.) [<u>PI</u> 77]

"Objects of comparison", unlike unconditional action-guiding commands, can be picked

up, tried out, put down until they serve a purpose. They furnish us models or patterns that enable

us to tell how things are, but do not tell us how things must be or ought to be. Recall

Wittgenstein's reminder to:

131. ... present[...] the model as what it is, as an object of comparison -- as, so to speak, a measuring-rod; not as a preconceived idea to which reality <u>must</u> correspond. ... [<u>PI</u> 51].

We can use the <u>norma</u>, <u>regula</u>, and <u>estandard</u> as prosaic illustrations of the role that Wittgenstein imagines for logic when he calls it a 'normative science', or of the role of Bayes' Theorem or the proposition of Universal Causality when we speak of using them regulatively in inductive practice.

Return to the "normative science" of the ultra-orthodox Bayesian. His rule is Bayes' Rule, his standard of rationality in belief revision is rigorous adhesion to it in updating his prior probabilities, whatever experience might bring. Suppose him to be a member of a scientific community whose dominant theory is facing a rising tide of anomalies, and in which an alternative theory has begun to emerge that employs a conceptual scheme not wholly definable in terms of the dominant theory. Shifting to this alternative theory would thus involve a discontinuous revaluation of priors, one not "driven" or licensed by evidence via Bayes' Rule. Suppose that, nonetheless, this alternative theory is making headway, gaining adherents as scientists use it to report novel, reproducible phenomena and improve our capacity to predict or control familiar phenomena -- though perhaps under different descriptions. The orthodox Bayesian will keep his head down in all the fuss, refusing to be distracted from his scrupulous conditionalization on his prior probabilities in obedience to Bayes' Rule.

Now in so doing, he will no doubt respond to critics by invoking Good's Theorem, to the effect that inquirers starting with different priors but religiously conditionalizing on new evidence, will in the limit converge in their posterior probabilities, and indeed converge upon a

hypothesis that accurately represents the underlying relative frequencies in the actual sample population.[8] "So I'll continue to keep my head down," the orthodox Bayesian concludes, satisfied he is missing nothing worth seeing. Unfortunately, this conclusion overlooks a condition of Good's Theorem: that the correct hypothesis is among (or is expressible in terms of) the set of hypotheses to which some finite initial prior probability was assigned. If this condition is not met -- if, say, unanticipated conceptual innovation is called for -- then conditionalization will not generate the novel hypotheses needed to get things convergent or correct. If Bayes' Rule were somehow unconditionally action-guiding, such that once we understood it we could not but follow it, we would, like the orthodox Bayesian, be launched into future experience upon rails, and could do little but hope that our initial hypothesis set was adequate.

Bayes' Theorem, then, might more profitably be thought of as a norma than as a super-norma. We can use it as a tool for regulating and checking how we reshape our beliefs in response to new evidence, as long as we keep our heads up to see whether certain appropriate conditions are met: that the beliefs in question can effectively be represented by as quasi-probabilistic degrees of credence in propositional contents, that fundamental conceptual revision does not appear to be called for, and so on. We can use it to keep ourselves honest, avoid certain forms of incoherence or self-defeating conduct, escape "base rate" fallacies, and promote evidence-driven convergence among inquirers with disparate starting points who accept the Theorem as an estandard, permitting an epistemic division of labor. In so doing we discipline ourselves to treat the Theorem as a categorical norma, not allowing personal preferences or interests to enter into its application.

But we had better not discipline ourselves to treat the Theorem as a super-norma, sticking

to the Rule religiously, come what may, and insisting that beliefs we cannot represent as quasi-probabilistic degrees of credence in propositional contents are without epistemic relevance. Not, that is, unless we are prepared to <u>ourselves</u>, or rather, that <u>part</u> of our scheme of beliefs and concepts that meet the conditions of application for the Rule, as authoritative about the bounds of real possibility.

A Kantian might insist that we have no choice but to attribute to ourselves such authority, at least at the most basic level of understanding. Reasons for belief must be reasons for any rational being, and so universally communicable in content, and empirical reasons for belief must be intelligible to empirical understanding -- which by its nature is limited to certain categories. Still, we cannot guarantee that these are adequate to things in themselves, and so cannot fully credit ourselves with theoretical reason or our categories with the status of <u>super-normae</u>. And to discover whether or not they are adequate is just the sort of thing that empirical inquiry by its nature cannot accomplish and that we have no other <u>super-norma</u> to assess.

Similarly in Kantian practical reason. Even the Categorical Imperative has conditions, without which we cannot guarantee the practical rationality of rigorously applying it as a <u>norma</u> or test to guide our deliberation and actions: we must have free will; virtue must be rewarded -- at least, in an afterlife -- with happiness; the maxim of our action must in some sense be available to us; and so on.[9] For Kant, we have no real alternative but to take it as an article of rational faith that these conditions to be met. Since knowledge of things in themselves -- such as the nature of the noumenal self -- is beyond our ken, and since empirical human nature is not "naturally harmonized" with the good, our only hope for only attaining genuinely moral or practically rational conduct must be to attempt insofar as we can to hold ourselves to the Categorical

Imperative as a guide in reshaping our subjective maxims. This does not, however, make the Categorical Imperative into a super-norma. For the rationality of applying and following this norma is not guaranteed, even though (according to Kant) we can be sure that if we do not deploy our capacities to act in a way that can be "squared" as best we can tell with this norma, we will not act as rationality requires.

In reality, I think, there is an alternative. For subsequent developments in geometry, science, psychology, and philosophy suggest that there were possibilities not entertained in Kant's own "hypothesis set", and that some of the categories he took to be fixed limits of understanding -- and the associated "antinomies" he identified -- might be overcome with theoretical and conceptual revision. (Much as 19th-century work on infinitesimals helped overcome the "antinomies" of calculus.) But this revision could only happen if our initial conceptual categories were not unconditionally and intrinsically "thought-guiding" -- were not themselves super-normae.

Postulates may, at any point in a practice, become more or less contexually necessary. A carpenter in her daily work takes her norma to embody a genuine right angle, her regula to be genuinely straight, often having no better standard of squareness or rightness to test them against. And her carpentry work would ever begin if, before relying on her norma or regula, she always had to check it against a standard ... and that standard against yet another ... . Nonetheless, the postulated accuracy of these tools is not irrevocable. If, for example, following them as closely as possible, she finds that joints and corners still do not fully touch, she will have them checked. Squares and straight-edges that have become warped are said to be "out of true", and to need "truing" against a more reliable standard lest they cease to serve well their ordinary functions. As

Wittgenstein observes in a related context:

> 125. ... The fundamental fact here is that we lay down rules, a technique, for a game, and then when we follow the rules, things do not work out as we had assumed. That we are therefore as it were entangled in our own rules. ... [PI 50]

If any actual norma ever came to be treated as a super-norma, to be followed however much the anomalies of application suggest that it might be warped or inadequate, our entanglement would be complete and irremediable.

Directions of fit

Thus we see in these normative uses not just one, but several "directions of fit". With respect to a given cut, the worker attempts to bring the workpiece into line with the norma or regula, not vice versa. With respect to a given norma or regula, a repairman or tool-maker attempts to bring it into "trueness" with a square angle or straight line. It is because the actual tools in circulation and use as normae and regulae correspond reasonably well to this objective standard of that workers can count on them as a shared and effective estandard in building projects. Yet we can always ask, of a given norma or regula, does it really embody the standard it purports to?

Moreover, we can ask a further question: Is this the relevant standard to be following? Given what we are attempting to build -- the site, the materials at hand, the planned or likely use, the tools we have to work with -- do square corners, vertical walls, and straight edges "fit" the task? Are we making a simple house, a ship, and arch? The question whether, or how much -- in which dimensions, say --, to follow norma or regula, and the related question whether, or how

much, to use some other tool as a guide, is another aspect of "fit".

Like the question of the tool's "trueness", these are not questions we can ask the tool itself to answer. We can unreflectively go on following the norma or regula even when that is not what we should be doing -- when it is pointless, or counterproductive, or dangerous. A mason who insists on squaring off the top of the springer stones of an arch, checking carefully with his norma, is creating not a superior structure, but an unstable hazard.

Not all hazard is physical, nor does it always lie in instability. If we were to watch an ultra-Bayesian Newtonian physicist meticulously updating his beliefs by conditionalization, refusing to be distracted from "staying the course" by all the excitement surrounding relativistic space-time, we might think it uncharitable to accuse him of irrationality or epistemic irresponsibility. But there is a kind of failure of fit between his avowed goal of being fully responsive to new evidence in the assessment of scientific hypotheses and the "epistemic rigor" of his practice. Similarly for the adherent of the Principle of Sufficient Reason, who continues to reject quantum theory as a priori unacceptable, despite its spectacular successes, out of concern that he be responsive only to "bona fide scientific reasons for belief". In both these cases, a certain excessive stability has become an epistemic hazard.

Let us now return to Wittgenstein.

Wittgenstein on the status of logic

We began this discussion of norma, regula, and estandard of correctness as an effort to make sense of Wittgenstein's intriguing invocation of Ramsey's remark that logic is a "normative

science", used as an "object of comparison" in the way a "measuring-rod" is used.

When I first encountered Wittgenstein's seeming endorsement of a normative conception of logic, I was deeply puzzled. The only "normative science" I had associated with logic was the sort of thing that had gone under the label "Principles of Right Reasoning" or "Rules of Mental Hygiene", and I had been taught that this sort of enterprise was to be distinguished sharply from logic proper. Logic is not about mental states or how we <u>ought</u> to think, I was told, but about formal, structural relations among propositions (or even the uninterpreted elements of a calculus). Mental states were for psychology to study; and ideals of mental hygiene, I supposed, were for tutors and preachers to espouse.

Now Wittgenstein does distinguish his conception of logic from an empirical, merely <u>a posteriori</u> science:

> 81. [L]ogic does not treat of language -- or of thought -- in the sense in which a natural science treats of a natural phenomenon ... .

> 108. ... We are talking about the spatial and temporal phenomenon of language, not about some non-spatial, non-temporal phantasm. [Note in the margin: Only it is possible to be interested in a phenomenon in a variety of ways.] But we talk about it as we do about the pieces in chess when we are stating the rules of the game, not describing their physical properties. [<u>PI</u> 38, 47]

This might suggest a contrast: pieces as obeying laws of physics vs. pieces as obeying rules that define legitimate moves. Is logic, then, an ideal set of rules that defines legitimate moves for thought and language -- just as "playing chess" without following the rules would <u>not</u> be playing chess at all? That would fit the talk of logic as an "object of comparison", yet clearly,

Wittgenstein wishes to distance his conception of logic as a normative science from this idea, too:

> 81. ... [we] cannot say that someone who is using language <u>must</u> be playing such a game [a "calculus with fixed rules"].
>
> ... [I]f you say that our languages only <u>approximate</u> to such calculi you are standing on the very brink of a misunderstanding. ... [T]he most that can be said is that we <u>construct</u> ideal languages. But here the word "ideal" is liable to mislead, for its sounds as if these languages were better, more perfect, than our everyday language: and as if it took the logician to shew people at last what a proper sentence looked like. [<u>PI</u> 38]

Logic does involve idealization, the creation of "crystalline" models. But the function of these models is not to give us an ideal for all thought and language, an image of how our thinking would be structured if all were right with us.

If logic is not normative in the sense of supplying an ideal that must be followed, in what sense could it be normative? In the sense that a <u>norma</u> is:

> 130. Our clear and simple language games are not preparatory studies for a future regularization of language ... . The language games are rather set up as <u>objects of comparison</u> which are meant to throw light on the facts of our language by way not only of similarities, but also of dissimilarities. [<u>PI</u> 50]

The <u>norma</u> and <u>regula</u> could be said to function regulatively for builders <u>a priori</u> -- as a standard we require our cuts to meet, and correct them to fit. This normative function is clearly distinct from any <u>a posteriori</u> claim based on investigative work concerning how our cuts actually are made. Wittgenstein says of logic:

... the crystalline purity of logic was, of course, not a <u>result of investigation</u>: it was a requirement.) [<u>PI</u> 46]

But what sort of requirement? One sense might be a <u>logico-metaphysical requirement</u>:

89. These considerations bring us up to the problem: In what sense is logic sublime?

For there seemed to pertain to logic a peculiar depth -- a universal significance. Logic lay, it seemed, at the bottom of all the sciences. ...

97. Thought is surrounded by a halo. -- Its essence, logic, presents an order, in fact the a priori order of the world: that is, the order of <u>possibilities</u>, which must be common to both world and thought. But this order, it seems, must be <u>utterly simple</u>. It is <u>prior</u> to all experience, must run through all experience; no empirical cloudiness or uncertainty can be allowed to affect it -- It must rather be of purest crystal. [<u>PI</u> 42, 44]

This logico-metaphysical conception -- for which Wittgenstein refers to his own <u>Tractatus Logic-Philosophicus</u> -- and the associated idea that we must be "the answer to [our] questions is to be given once for all; and independently of any future experience" [<u>PI</u> 43] is what he has now come to reject:

101. We want to say that there can't be any vagueness in logic. The idea now absorbs us, that the ideal '<u>must</u>' be found in reality. Meanwhile, we do not as yet see <u>how</u> it occurs there, nor do we understand the nature of this "must". We think it must be in reality; for we think we already see it there.

102. The strict and clear rules of the logical structure of propositions appear to us as something in the background -- hidden in the medium of the understanding. I already

see them (even though through a medium): for I understand the propositional sign, I use it to say something.

103. The ideal, as we think of it, is unshakeable. You can never get outside it; you must always turn back. There is no outside; outside you cannot breathe. -- Where does this idea come from? It is like a pair of glasses on our nose which we see whatever we look at. It never occurs to us to take them off. ...

114. (Tractatus Logico-Philosophicus, 4.5): "The general form of a proposition is: This is how things are." -- That is the kind of proposition one repeats to oneself countless times. One thinks that one is tracing the outline of the thing's nature over and over again, and one is merely tracing round the frame through which we look at it. ... [PI 45-48]

In this logico-metaphysical conception, we find the problem of the a priori status of logic as often posed by philosophers: logical possibility delineates the whole domain of possibility, and does so a priori -- giving conditions that must be met if meaningful thought and language are to be possible at all.

But an alternative conception of the sense of "requirement" in which the "crystalline purity" of logic is a requirement of investigation is the sense in which use of a norma or regula is a requirement: we require this of ourselves because we have needs that squared and straight lumber and stone can meet.

108. ... The preconceived idea of crystalline purity can only be removed by turning our whole examination round. (One might say: the axis of our examination must be rotated, but about the fixed point of our real need.) [PI 46]

Following the norma or regula is something we can advantangeously require of ourselves, once

we have made these tools. Following rules of logic in our propositional reasoning -- and

rejecting propositional reasoning that seems plausible but is in fact invalid -- is also something

we can profitably require of ourselves, once we have used our existing language to construct this

ideal language with its fixed rules. This of course would not be true were the rules of logic as

arbitrarily related to enduring human cognitive and practical needs as the rules of a board game.

A propositional structure may be a "medium", a "method of representing the thing", or a "frame

through which look", but this no more makes it "subjective" in its character or arbitrary in its

capacities than is the builder's <u>norma</u> and <u>regula</u>. The objective, precise, rule-governed features

of a propositional structure suit it well for a wide range of representational and deliberative

purposes, even if it does not capture the one essential structure that underlies all thought and

reality. For what is the propositional structure of phenomenal experience? Of <u>de se</u>

attribution?[10] Of the similarities and dissimiliarities of images (including "family

resemblances"), or of the looks, sounds, feels, smells, and tastes that tell us "what something is

like", and guide so much of our thought, judgment, and communication?

107. The more narrowly we examine actual language, the sharper becomes the

conflict between it and our requirement [of "crystalline purity"]. ...

108. We see that what we call "sentence" and "language" has not the formal unity

I imagined, but is the family of structures more or less related to one another. ... [<u>PI</u> 46]

A worry jumps out at us. If language is not, or not entirely, unified into a propositional

structure, if our system of thoughts and beliefs is not just a system of propositions, governed by

logic, doesn't logic become <u>too optional</u>?   That we might pick it up, or put it down -- decide on

its applicability? Continuing with Wittgenstein:

108. ... But what becomes of logic now? Its rigour seems to be giving way here.
But in that case doesn't logic altogether disappear? -- For how can it lose its rigour? Of
course not by our bargaining any of its rigour out of it. [PI 46]

We do not "bargain" the rigor out of a norma when we set it aside in order to cut an angled block
for an arch, nor can we by this act "decide" that it does not apply to the block -- the norma will
apply and will show a gap whether we actually apply it or not, and whether we welcome this gap
or not. If a norma-shaped object were made of a material so flexible that it would
uncomplainingly fit the angle of arch stone, it would be less functional as a norma for carpenters
and masons -- they need a rigorous (from rigere, "to be stiff") standard of squareness. So there is
no desire to diminish the norma's rigor, or make the norma "disappear", even as we realize that it
is not an all-purpose guide, and that it is able to guide us as reliably and truly as it does precisely
because it does not "accommodate" to all cutting tasks, including those are better done by making
something unsquare.

Similarly, "tool assortment" propositional logic offers us includes the pattern of the truth-
table used to define the material conditional. Thanks to this truth-table, we have a rigorous check
for the validity of inferences, given no more than the truth-functions of the component parts and
their structural relations. In doing many kinds of reasoning, from proof in mathematics to
spotting fallacies and unacknowledged commitments in ordinary deliberation, we desperately
carry out this sort of check of correctness in an inference. So we would be ill-advised to
"bargain" this rigor out of the material conditional.

But we would also be ill-advised to assess all "if ... then ..." reasoning in actual life by
applying the norma of the material conditional, "correcting" all conditional reasoning until it

meets this truth-functional standard. Without access to "strong conditionals", and to different standards for assessing them, we would assign the same truth-value to, for example, 'If John were hearing this, he'd be outraged' and 'If John were hearing this, he'd be delighted'. That would diminish, not enhance, our deliberative capacity and the expressive power of language and thought -- especially since a chief function of deliberation is to consider hypothetical (i.e., non-actual) circumstances. So disciplined in our reasoning, we would be less rather than more rational -- if 'rational' means anything like "capable of responding to reasons" -- in thought and action.

Propositional logic as _norma_ does not "disappear" or lose rigor when we engage in non-truth-functional inference. On the contrary, we may rely upon its rigor in such cases precisely to discover and understand _dissimilarities_ as well as similarities (compare Wittgenstein's remark about "similarities" and "dissimilarities", quoted above and at PI 50). Who among us has not taught undergraduates the non-truthfunctional character of ordinary "if ... then ..." inference by showing how it does not fit the _norma_ of the material conditional's truth-table?

Thus, if propositional logic really determined the bounds of thought, we would be much less thoughtful in many ways. We could not reason using non-propositional image-evaluation or -comparison ("What is the criterion for the sameness of two images?", PI 117), could not reflect guided by the felt character of various imagined situations ("What is the criterion for the redness of an image?", PI 117), could not hpothesize _reductios_, could not follow a chain of merely associative resemblance which could not be distilled into propositional form, could identify the analogies that help us understand themes in music:

527. Understanding a sentence is much more akin to understanding a theme in

music than one might think. ... One would like to say "[I understand a theme] Because I know what it's all about." But what is it all about? I should not be able to say. In order to 'explain' I could only compare it with something else which has the same rhythm (I mean the same pattern). (One says "Don't you see, this is as if a conclusion were being drawn" ...).

528. It would be possible to imagine people who had something not quite unlike a language: a play of sounds, without vocabulary or grammar. ...

529. "But what would the meaning of the sounds be in such a case?" -- What is it in music? [PI 143]

Indeed, neurological evidence increasingly suggests that the processes underingly even our propositional reasoning are themselves associative and non-computational, drawing upon a mental architecture cobbled from many interactive components rather obeying a unifying master program.

We should no more tax these alternative forms of cognition, communication, and understanding with "failure to fit" the norma of propositional logic than we should tax a builder's square for failure to fit arch stones or to help us regulate surface color. Nor should we "bargain away" the simplicity and purity of propositional logic in an effort to accommodate all such mental activity, any more than we should seek to develop a super-norma to replace our familiar box of non-super tools. We should instead see that categorical, strict normae for assessing truth-functional consistency and validity are valuable assets in our mental toolkit. For they are crucial to making good use of a representational system such as is afforded by propositions, where the estandard of correctness (alignment or co-alignment) is truth, and the estandard of equivalence or

inclusion therefore truth-functional. It is difficult to imagine, for example, that scientific understanding of natural phenomena could have reached anything like its current state of development and dispersion of co-ordinated effort without such a representational scheme. But this does not show the propositional system portrays is adequate to express everything that might be or be thought, or that it could ever serve as an autonomous replacement for our ordinary language, thought, and ways of being guided by experience.

"But don't we, at bottom, use logic in order to decide whether to use this supposed 'tool' you are calling 'logic'? So isn't logic at the bottom of thought, at the limits of reasoning, after all?" We do indeed use logic in such decisions. We also use purposes, capacities to recognize and compare formal patterns and sensory experiences, non-truth-functional inferences, analogical reasoning, and more. And we need an antecedently-understood metalanguage -- ordinary language and thought -- with which to introduce and interpret the propositional calculus and its fixed rules. To repeat an ealier passage:

120. When I talk about language (words, sentences, etc.) I must speak the language of every day. Is this language somehow too coarse and material for what we want to say? Then how is another one to be constructed? -- And how strange that we should be able to do anything at all with the one we have! [PI 49]

The need for the a priori

We need the a priori in part because we need to be able to regulate our practices by norma that fit various purposes and can be used as standards for our often actual imperfect performance, that do

not simply bend to fit that performance <u>a posteriori</u>, as empirical generalizations must if they are to be correct. Depending upon the purposes, these <u>norma</u> will have different characteristics. Some will correspond to well-defined formal features and exhibit high rigidity and wide range in application -- like a carpenter's square or mason's straight-edge, or the propositional calculus.

Thinking of logic as such a <u>norma</u> does not, however, require us to think it is unconditional in application or inherently thought-guiding -- some of our thinking does not satisfy the conditions for logic's application, and none of our thinking is "guided by" logical standards except that we by our tacit or explicit commitments make it so. At the same time, nothing about our commitments makes propositional logic either applicable or inapplicable to the propositional content of what we believe -- it is a categorical <u>norma</u> (or set of <u>normae</u>), though not inherently and unconditionally action- or thought-guiding.

As a result, the <u>a priori</u> character of propositional logic need not stand between us and mental adaptiveness, including conceptual innovation in the rules of reason themselves. Of course, we might decide that the only <u>norma</u> or <u>normae</u> of reasoning properly called 'logic' are those determined by the familiar constants of the classical propositional calculus. But that itself is no barrier to conceptual innovation in the rules of reasoning -- it means only that we will use another term -- e.g., 'analogical reasoning' as opposed to 'logical reasoning' -- as we label the items in our toolkit, and debate which ones, if any, to use in a given application.

If meaningful thought or language required propositional logic as a <u>super-norma</u> -- a <u>norma</u> we cannot fail follow if we are to think or communicate meaningfully at all -- then thought and langauge would force us onto rigid rails, which we must follow indefinitely, come what may. Experience, as in the Bayesian simulacrum, could never justify our making revisions

<u>a posteriori</u> to the core structure of the scheme of representation itself. And if schemes of

representation really were like that -- or <u>had</u> to be like that in order to function meaningfully or

"capture reality" -- they would be much less useful things. And thought and language themselves

would much less effective as sources of humankind's vaulted aptiveness to the world.[11]

Notes

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1. T. S. Kuhn, <u>The Structure of Scientific Revolutions</u>, 2nd ed. (Chicago: University of Chicago Press, 1970), ch. 6.

2. All page references in the text are to Ludwig Wittgenstein, <u>Philosophical Investigations</u>, 3rd ed., Trans. by G. E. M. Anscombe (London: Macmillan, 1953), hereinafter abbreviated as <u>PI</u>.

3. I am indebted here to a seminar on quantum logic taught by Saul Kripke at Princeton University in 1977. I do not know whether he would accept the view attributed to him here.

4. See Paul Boghossian, "The Status of Content", <u>The Philosophical Review</u> 99 (1990): 157-184.

5. Lewis Carroll, "What the Tortoise said to Achilles", <u>Mind</u> 4 (1895): 278-280.

6. The derivations for 'rule' and 'norm' go via Latin and seem to be well-established. The derivation for 'standard' goes via Frankish, and is more uncertain. Tracing <u>regula</u> further back, we get the purported Indo-European root <u>reg-</u>, for movement in a straight line; tracing <u>norma</u> further back we get the purported Indo-European <u>gno-</u>, for knowing (hence, a tool for knowing when something is straight, just as the Greek <u>gnomon</u> was a device for telling the time by casting a shadow on a sundial); tracing <u>estandard</u> further back we get the purported Indo-European <u>sta-</u> + <u>kar-</u>, to stand fast (or "stand hard"). (Etymologies and purported Indo-European roots from: <u>The</u>

American Heritage Dictionary, 3rd edition, ref.) Apologies in advance to readers of my paper, "Normative Force and Normative Freedom: Hume and Kant -- but <u>not</u> Hume vs. Kant", <u>Ratio</u> (forthcoming), which discusses these etymologies and the examples they support.

7. For further discussion of the normative as a domain of freedom, see P. Railton, "Normative Force and Normative Freedom".

8. See I. J. Good, "Weight of Evidence, Corroboration, Explanatory Power, Information, and the Utility of Experiments", <u>Journal of the Royal Statistical Society</u> B 22 (1960): 319-331 and 30 (1968): 203; and "On the Principle of Total Evidence", <u>British Journal for the Philosophy of Science</u> 17 (1967): 319-321. For some discussion of the implicit assumptions of Good's results, see Paul R. Graves, "The Total Evidence Theorem for Probability Kinematics", <u>Philosophy of Science</u> 56 (1989): 317-324. For Good's own reservations about Bayesianism, see his "Explicativity, Corroboration, and the Relative Odds of Hypotheses" [with comments and a reply], <u>Synthese</u> 30 (1975): 39-93.

9. Strictly speaking, we should distinguish the "test of the maxim of our will" contained within the Categorical Imperative, which is, in effect, the <u>norma</u>, from the Categorical Imperative proper, which is a rule to the effect that we should always act so that our will's maxim can pass this test.

10. See David Lewis, "Attitudes <u>De Dicto</u> and <u>De Se</u>", in his <u>Philosophical Papers</u>, vol. I (New York: Oxford University Press, 1983).