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Habitual Spectra**

D. M. Johnson

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HUME'S MISSING SHADE OF BLUE,
 INTERPRETED AS INVOLVING HABITUAL SPECTRA

David Hume claimed that his hypothetical case of the unseen shade of blue posed no fundamental problem to his general empiricist principle. But I believe it well may show exactly what he denied it showed -- viz., that his empiricism rests on a mistake.

Hume says:

Suppose ... a person to have enjoyed his sight for thirty years, and to have become perfectly well acquainted with colours of all kinds, excepting one particular shade of blue, for instance, which it never has been his fortune to meet with. Let all the different shades of that colour, except that single one, be plac'd before him, descending gradually from the deepest to the lightest; 'tis plain, that he will perceive a blank, where that shade is wanting, and will be sensible, that there is a greater distance in that place betwixt the contiguous colours, than in any other. Now I ask, whether 'tis possible for him, from his own imagination, to supply this deficiency, and raise up to himself the idea of that particular shade, tho' it had never been conveyed to him by his senses? I believe there are few but will be of opinion that he can....¹

Sometimes one is surprised by the colour which emerges when one mixes paints, powders or lights of different hues, in the sense that one is unable to imagine this resulting colour until one actually sees it. I often have analogous experiences when sight-reading music on the trombone. If there is a large, unfamiliar interval between the note I am playing and the one to be played next, so I cannot 'hear' the next note inwardly, I bring the slide to the correct position, set my lips at approximately the right tension, and presto! the correct note appears, despite

my inability to predict what it was going to sound like. Only after I have heard it can I also 'hear' it, i.e., predict its occurrence in this melodic line. Cases like these are not puzzling philosophically, because in them, the note, colour, etc. arises primarily from the equipment used -- e.g., paints, powders or lights, the trombone and tension of the lips, and so on -- rather than from the mind of the person who uses these things. But in Hume's example, no extra-mental objects or events play a direct role in creating the imagined colour. In fact, this colour never appears at all outside the subject's mind, and he never sees it. Therefore here the imagined colour is produced entirely by the subject himself, without his having copied it from anything in the external world.

Yet this contradicts the maxim Hume laid down at the beginning of the Treatise that all simple ideas arise from correspondingly simple (sense) impressions.

Two points perhaps mitigate the seriousness of the problem set by the missing shade of blue. First, Hume saw clearly, as Locke did not, that "innate" does not mean the same as "justified."² He was not so much concerned with the question of where ideas come from, as with how these ideas can be shown to be legitimate. His answer to the latter question is that experience alone is competent to show this. Second, strictly speaking, no idea is itself a piece of knowledge, but only something with the help of which one constructs knowledge-claims; and it is necessary for a person to justify knowledge-claims which are composed of innate ideas, by checking them against experience, just as much as knowledge-claims composed of non-innate materials. For example, suppose I possess innately the idea (visual image) of blue and the idea (tactile image) of cool. To say that these ideas are innate means that they are merely triggered or activated in my

mind by experiences I happen to have, but are not created by these experiences, and are not necessarily copies of them. Nevertheless, in order for me to know something which involves these ideas, I first must put them together in a judgment, and then confirm that judgment by appeal to experience. For instance, I might use these ideas to make the judgment, "Seeing the colour blue always makes me feel cool," and then confirm (or disconfirm) this by observation and introspection.³ Thus, that which makes Hume an empiricist rather than a rationalist is not that he denies the possibility of innate ideas, but that he denies the existence of a priori synthetic knowledge, i.e. beliefs which do not owe their justification to sense-experience, but which nevertheless indicate in a justified way what the world is like.

However, these mitigating factors still do not account for the fact that, in spite of the case of the blue patch, Hume continues to employ his copy theory of ideas as a principle⁴ for testing the legitimacy of metaphysical notions like substance, cause, existence, self, etc. The problem is this: Hume proposes to ignore the case of the missing blue -- while not denying that it really is a counter-example to his copy theory -- on the grounds that it

...is so particular and singular, that 'tis scarce worth our observing, and does not merit that for it alone we should alter our general maxim. (T6)

But how can he claim that this case is isolated, when all simple ideas (and therefore the materials for all our notions and judgments without exception) are capable of being arranged in series of resembling instances, so that a person might arrive at any one of them by extrapolation from other members of a series, in exactly the same way as the imagined subject arrived at the shade of blue in Hume's example?⁵ In fact, it

ought to be possible for a person to obtain, by means of such imaginative extrapolation, not only simple ideas which correspond to (but are not copies of) certain impressions he might have had in the past, but even ideas that correspond to (but do not copy) impressions which he never could have had -- e.g., high-pitched sounds which only creatures like bats and dogs literally can hear, infra-red colours which only creatures like bees literally can see, and so on. Thus, we must conclude that if one's ideas are limited neither to impressions he actually has had, nor even to the bounds of his possible sense experience, then Hume's proposal to test the legitimacy of philosophical notions by tracing back to the impressions with which they originated must be pointless.

Presumably, the reason Hume dismisses the case of the missing shade of blue as unimportant is that he thinks his general theory of knowledge contains resources capable of blunting the objection it poses -- resources he does not mention, but which he might have given if pressed. What could these resources be?⁶

Some commentators maintain that this case does not really count as a counter-example to the copy principle, since -- analogous to Wittgenstein's private language argument -- there is no way of verifying whether the subject in fact receives the idea of this particular shade prior to having a corresponding impression.⁷ However, the trouble with this defence is that Hume does not employ it in his own behalf. Rather, he cheerfully admits that this case is an exception to his principle -- something one hardly would expect him to do, if his means of dealing with it were an implicit argument to show it was not an exception.⁸

A similar point also answers those⁹ who argue that the case of the missing blue is not an exception to Hume's copy principle, because we can account for

the acquisition of this idea in terms of the processes -- which Hume admits elsewhere -- of abstraction and association of ideas. First, these authors say, the person (or his mind) notices and abstracts the precise degree of difference in colour between each pair of patches in the scale of blue shades before him. He then arrives at the new idea of the unperceived blue by imagining that this same degree of 'becoming lighter' were added to, or associated with, the shade he finds on the dark side of the perceived gap, or imagining that the same degree of 'becoming darker' were added to the other shade on the light side of the perceived gap. However, this proposal explains the point without explaining it away. In other words, even if the procedure outlined is the correct account of how one goes about obtaining a simple idea without first having had a corresponding impression, the fact remains that Hume's copy principle still has at least this one counter-example;¹⁰ and one such exception is as good as a thousand.

The supposedly universal rule announced at the beginning of the Treatise specified that a person copies all simple ideas from corresponding impressions. A third possible way of defending Hume's theory would be to show that the missing blue is not really a simple idea.

Is the only alternative to a mental item's being a simple idea for it to be a complex idea? No. Locke, for example, thought that one need not separately perceive something to medium dark peacock blue, robin's egg blue, etc. in order to have all these shades before his mind, because these are not simple ideas in addition to blue, but only simple 'modes' of blue -- i.e., particular ways that this idea may exist and be contemplated.

However, Hume explicitly rejects Locke's suggestion, and affirms that each distinguishable shade must be a separate simple idea. His reason is that the extremes on a graded scale of shades are obviously different from one another, and therefore produce distinct ideas. But this difference is constituted by nothing else than the series of intermediate shades, each of which merges imperceptibly into the next. Therefore if the ends differ, and also merge imperceptibly into the series of means, then each of the means likewise must be different, even in cases where we are unable to detect differences between them.

I believe it will readily be allow'd, that the several distinct ideas of colours, which enter by the eyes ... are really different from each other, tho' at the same time resembling. Now if this be true of different colours, it must be no less so of the different shades of the same colour, that each of them produces a distinct idea, independent of the rest. For if this shou'd be deny'd, 'tis possible, by the continual gradation of shades, to run a colour insensibly into what is most remote from it; and if you will not allow any of the means to be different you cannot without absurdity deny the extremes to be the same. (T5-6)

A fourth defence would admit that the missing shade of blue is an exception, but insist that Hume found a way of limiting the number of such exceptions, so as not to threaten at least the general applicability of his principle. This 'isolation' strategy is likely to be that which Hume in fact had in mind, because it fits so well what he actually said. Why, for example, does he stipulate that the observer in his example "have enjoyed his sight for thirty years," and that he be acquainted with all other shades of blue besides the missing one? The plausible answer¹¹ is that Hume

intended to use these requirements to limit the number of similar exceptions.

Yet there is still a problem with this account of Hume's strategy. The problem is that while the above requirements obviously restrict the number of possible cases analogous to the missing shade of blue, why did Hume think it was legitimate so to impose these requirements? (Thomas, in his paper, for example, never asks himself this obvious question.)

I propose as an answer -- i.e., a key for understanding Hume's isolation strategy, and why he supposed this strategy would work -- that he modelled his solution to the puzzle of the missing shade of blue on the pattern that he also used when he talked about knowledge of causality. The idea of causal necessity, according to Hume, arises from observation of oneself, rather than observation of things. For example, the origin of someone's belief that a certain stone released in midair must fall is that he feels this necessity in himself. In particular, one gets the idea of necessary causal connection from an inner impression of constraint, arising from a habitual expectation that the stone will fall, built up as a result of many similar past observations.

Suppose Hume thought of perception of colour analogously. In that case, his insistence that only someone who has used his eyes for thirty years can imagine a colour without having seen it first, stems from a belief that acquaintance with some limited sample of colours does not necessarily enable one to do this. More particularly, the reason merely 'catching sight' of certain colours is insufficient to allow one to reconstruct another colour imaginatively is that, in themselves, colours have no order. Rather, Hume would say, for a person to reconstruct a shade he never saw before, he must have developed an appropriately

detailed 'habitual spectrum' -- i.e., an ordered set of tendencies and expectations concerning colours, built up as a result of long experience with things having those colours -- which he then employs as a basis for generating that shade. Thus, for example, when a very young child looks at samples in a paint store, the colours he sees, and (if this is any different) the simple ideas he obtains by looking at them, stand in no natural or necessary relations to one another. Instead each is sui generis. The set of habits for dealing with such colours and objects which have them, which a person gradually acquires, then puts them into certain relations. This, in turn, makes it possible for him to extrapolate from the relational series of colours in such a way as to obtain a mental picture of a missing member of it.

This supposition I am attributing to Hume -- viz., that there are only habitually imposed, but no real or intrinsic connections between (ideas of) colours, and that this special circumstance enables one sometimes to imagine a colour without having seen it -- is an ordinary synthetic claim that a person conceivably could test by experiment.¹² However, what would the facts have to be, to justify Hume's conviction that, in view of the preceding supposition, the exceptional case of the missing shade of blue does not disturb his general empiricist maxim? When one considers this question, Hume's isolation strategy becomes suspicious. More particularly, at least three things would have to be the case if the above way of explaining the example of the missing shade were correct. Yet there are no reasons for supposing these things to be the case, and several for supposing they are not the case.

(a) The most obvious prediction based on the above Humean doctrine is that no child could generate

the unperceived blue shade mentally, because children lack sufficient experience to have formed the habitual colour spectrum required for this.¹³ It would be a remarkable fact if there really were this important difference between the minds of children and adults. There are no obvious reasons for supposing that one's ability to imagine a colour he has not previously seen depends on, and develops as a result of age, practice and experience. And we do not commonly or naturally assume such a thing. Therefore the burden of proof must be shouldered by anyone who makes such a claim. Is there any empirical (or conceptual) support for it? I, at least, know of none. Mature people tend to be more articulate and definite in their use of colour words, and more effective and confident about sorting things on the basis of colour, than are children. But differences like these do not show that children are unable to imagine an unperceived colour. Rather, it is most plausible to suppose that young thinkers and perceivers can do everything that adults can do in this respect, even though they are less able to report or describe these mental accomplishments.¹⁴

Next (b) one might predict that since there is no 'natural' spectrum of perceived colours common to all humans, people who have sufficiently different experiences with colours over their lifetimes will form habitual spectra organized in significantly different ways, and as a result also have differing abilities to imagine unperceived colours. Not only is there a lack of supporting evidence for this claim, but some available results indicate that it is false.

People from various linguistic groups divide the spectrum differently, as reflected by the differing boundaries presupposed by their colour-words (e.g., Navahos use one word for what we call 'blue' and 'green'). Nevertheless cross-cultural research --

e.g., giving unilingual speakers of different languages a series of colour samples to discriminate and sort -- indicates that, as far as the researchers were able to determine, all these subjects (i) perceived the same colours, and (ii) ordered them, relatively, in the same way.¹⁵ In other words, despite the fact that the subjects named the colours they saw differently and tended to group them differently on the basis of these names, they still were able, more or less uniformly, to report the differences between all the colours they saw.

Presumably, the reason people from disparate cultures find it natural to divide the colour spectrum differently in their languages is that they have different uses for, and experiences with colours. For example, everyday intercourse with colours among Navahos -- who work with silver and jade, make pictures with natural shades of sand, and dye fabrics with substances readily available to them -- should differ systematically from ours, or from that of Inuit -- who work with soapstone and ivory, and dye fabrics and pictures with other substances. And one can expect these differences to be reflected in their respective languages. Thus, since the colour of jade typically falls between what we call 'blue' and 'green,' Navahos are bound to find our way of dividing the spectrum unhelpful for talking about this stone. Nevertheless, unilingual Navahos, Inuit and speakers of English all are able to make the same colour discriminations under experimental conditions. And this shows that Humeans are wrong if they suppose that the colours a person is able to see or construct imaginatively from seen colours depends on visual experiences he happens to have had, or habits he happens to have formed.

Finally (c) the above doctrine implies that one will know better or worse, with more assurance or less,

that certain colours and shades are incompatible with certain others, depending on how much experience¹⁶ he has had with each. For example, most people should know that red excludes blue with greater assurance than that sepia excludes puce, because they have had more experience with the first two colours than with the latter pair. Yet this third point provides the clearest proof that the above doctrine is wrong, because as soon as one makes this prediction explicit, any such Humean doctrine is robbed of all plausibility. Nothing can lead us to believe in such differences, since it is an obvious matter of commonsense that every person has exactly the same degree of confidence about the exclusiveness of every pair of colours that he ever will meet -- viz., certainty.¹⁷

Whether or not Hume really held it,¹⁸ then, the trouble with the above doctrine is that it depicts all our knowledge of colours as subjective, piecemeal and contingent; but concrete awareness and use of colours lends no support to such a view. Rather, we 'know too much' about colours for this to be true. This excess of knowledge shows it is essential¹⁹ to any colour, not just accidental, that it stand in certain definite relations to other colours. If this last claim is true, it implies that one cannot obtain a usable idea of just one colour at a time. In other words, an observer either must acquire a whole set of colour-ideas (although not, perhaps, a complete set) or get nothing at all. This consideration goes part of the way to show that the very notion of 'simple idea' that we find in philosophers like Locke, Berkeley and Hume is a contradiction in terms.²⁰

The lesson from all this is that, in an important respect, Hume is inconsistent. He takes as a principle that no one should accept any truth of fact, unless he can justify it by tracing each element in it

to something he himself has perceived. But his copy theory of ideas is itself unjustified according to the same methodology, because we do not observe that people learn -- for example, about colours -- by means of perceiving, in the way this theory specifies. Thus, an honest empiricist cannot also be a 'strict' empiricist in Hume's sense, because it is inconsistent to exclude (as Hume does) all possibility of a priori synthetic knowledge on merely a priori grounds.²¹

D.M. Johnson
York University

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- 1. David Hume, A Treatise of Human Nature, ed. L.A. Selby-Bigge (Oxford, 1960), hereafter T.
- 2. In this, Hume agreed with Kant. Cf. the latter's comment that "Crusius ... thought ... that a spirit, who can neither err nor deceive, implanted laws in us originally. But since false principles often intrude themselves ... we are involved in difficulties as to the use of such a principle in the absence of sure criteria to distinguish the genuine origin from the spurious, since we never can know certainly what the spirit of truth or the father of lies may have instilled into us." (Prolegomena to any Future Metaphysics, ed. L.W. Beck (Indianapolis and New York: Bobbs-Merrill, 1950) p. 66, n. 11.)
- 3. Cf. Bernard Rollin, "Hume's Blue Patch and the Mind's Creativity," Journal of the History of Ideas, 1971 (32), p. 126.
- 4. James Noxon, (Hume's Philosophical Development: a Study of his Methods, (Oxford, 1973) p. 144.) distinguishes (1) Hume's maxim that all simple ideas are derived from corresponding impressions -- which Noxon calls the 'copy theory,' and (2) the application of this maxim as "a technique for investigating terms which are suspected of not having the meanings imputed to them in philo-

sophical theories" -- which Noxon calls the 'copy principle.' This is a convenient terminology, which I shall adopt in the following.

5. A.N. Whitehead argued on similar grounds that Hume's copy principle was not a legitimate standard for criticising philosophical assertions. Cf. Process and Reality: an Essay in Cosmology (Macmillan, 1960) p. 133.
6. Rollin (op. cit., p. 120) reminds us that Hume easily could have omitted all mention of the missing shade of blue in the Enquiry, where he revised and edited material which previously appeared in the Treatise. Further, it would have been reasonable for him to do this, if he felt this case posed a problem for his theory of knowledge for which he had no answer. Nevertheless, he repeats his account of the missing shade in the Enquiry, in virtually the same words that he also used in the Treatise.
7. Op. cit. Rollin, p. 128. Also cf. W.T. Stace, The Nature of the World: an Essay in Phenomenalist Metaphysics (Greenwood Press, 1969), p. 25 and John Laird, Hume's Philosophy of Human Nature (Archon, 1967), p. 36.
8. Cf. Max M. Thomas, "Why the Missing Shade of Blue Counter-Example isn't a Problem," an unpublished paper presented at the Eleventh Hume Conference, York University, August 24, 1982.
9. Cf. op. cit., Stace, p. 26; Norman Kemp Smith, The Philosophy of David Hume: a Critical Study of its Origins and Central Doctrines (Macmillan, 1966), p. 206; Daniel E. Flage, "Hume's Relative Ideas," Hume Studies, April 1981 (VII), p. 68. (I owe these references, and those of the previous note but one, to op. cit., Thomas.)
10. Again, cf. op. cit., Thomas.
11. This is the answer proposed in op. cit., Thomas.
12. Cf. Arne and Siri Naess, "Psychological Research and Humean Problems," Philosophy of Science, 27 (1960), pp. 134-46.
 Something like the above claim is debated by practicing scientists at the present time. For instance, (see Stephen M. Kosslyn, "The Medium and the Message in Mental Imagery: A Theory" in Imagery, ed. Ned Block (Cambridge, Massachusetts: MIT Press, 1981) p. 239) experimenters asked a

group of people to imagine alternating black and white striped gratings receding into the distance, to test how far away the gratings would seem to the subjects at the point when the stripes blurred into a uniform grey field. They discovered that imagined vertical stripes seemed to blur at greater distances than oblique ones. However, none of the subjects was explicitly aware of this 'oblique effect,' which also occurs in connection with perception (as the experimenters reconfirmed by means of a separate group performing the perceptual analogue of the same imagery experiment). How should one explain this convergence of experimental results? Some hypothesize that there is an innately given 'medium' common to imagining and perceiving, which limits the allowable forms imagination can take in all human beings. Others reject such a suggestion, and say that imagining is simply a form of common-sense reasoning, in which one makes use of 'tacit knowledge' that he has acquired from perception. As a result of perceiving, the latter theorists claim, one learns certain things about how objects look and behave, without being aware that he has learned these facts, and without being able to express this knowledge in words. According to them, the oblique effect is an example of something known in this tacit way by the subjects of the previously mentioned experiment.

13. Again, analogously to my proposed interpretation of Hume, the second set of theorists mentioned in the preceding note presumably would say that any child who lacks sufficient perceptual experience could not imagine a scene as involving the oblique effect.
14. What about our common observation that paint salesmen and fabric dyers who have a great deal of experience obviously can make more, and more subtle discriminations of colour than those just beginning in these professions? (I owe this objection to one of the referees of this journal.)

The fact mentioned here is undeniable. But how should one interpret it? A Humean (as I have construed Hume's position) would say that these people's training and experience somehow create the differences of colour which they see. As opposed to this, I say that their training merely enables them better to notice differences of colour which are already there 'before their eyes.' My interpretation is supported by the observation that it seems possible, in a controlled experimental environment, to bring 'naive,' inexperienced

subjects to notice all the same differences of colour that experienced subjects also notice (despite the fact that the former will have many fewer names for the colours they discriminate).

15. Cf., e.g., Roger Brown, Words and Things (Glencoe, Illinois: The Free Press, 1958) pp. 237 ff.
16. Hume's distinction between "sensation" and "experience" is that the latter presupposes what he variously refers to as "memory," "custom" or "use," in a way that is not true of the former. Cf., e.g., op. cit., pp. 5, 20-22 and many other places.
17. See again, note 14.
18. A reason for supposing that Hume finally decided not to accept this doctrine is the passage he added in the Appendix -- note to Book I, page 20, line 17, to the word (resemblance), (p. 637) -- which reads in part:

'Tis evident, that even different simple ideas may have a similarity or resemblance to each other; nor is it necessary, that the point or circumstance of resemblance should be distinct or separable from that in which they differ. Blue and green are different simple ideas, but are more resembling than blue and scarlet; tho' their perfect simplicity excludes all possibility of separation or distinction.
19. To say that a certain property is essential to a thing means that to describe the thing as having that property conveys no information. (Cf. F.I. Dretske, Knowledge and the Flow of Information (Cambridge, Massachusetts: Bradford Books, MIT Press, 1981) pp. 65, 217, 221-1.)
20. Such a claim is borne out by observation. For example, pedagogical research shows the best way of teaching children abstract (e.g., mathematical) facts is to supplement verbal explanations with physical models of figures, numbers, etc. made of wire or clay, which the students hold, shape and move. Presumably, this is effective because it makes available a greater amount and variety of background knowledge on which students can draw in their attempts to settle each new piece of knowledge into a supporting context. The situation may seem different in the case of acquiring knowledge of simple colours like red. Here at least, one may feel, no context is relevant, since each thing a person learns stands by itself and

presupposes nothing. Again, however, in concrete cases we see that, in the absence of background knowledge, one cannot know a colour in the sense of adding it to his repertoire of employable, reidentifiable ideas. Consider, for example, previously blind people to whom sight was given for the first time, by surgical means. Such people often see things plainly, as measured by the fact that, when asked, they can report more or less the same visual characteristics as other sighted people. But they remain unable to make sense of these seen colours, shapes, etc., so as to use them as a practical guide to the identity and properties of objects. (Cf. "Recovery from Early Blindness: a Case Study," R.L. Gregory and J.G. Wallace, reprinted in Perception: selected readings in Science and Phenomenology, ed. Paul Tibbetts, pp. 357-388, especially, p. 382.) (This shows, incidentally, that if Christ really did give sight to the congenitally blind, as reported in the New Testament, this must have been an even more significant occurrence than the biblical account leads one to suppose. Not only would the retinas, optic nerves, visual centres, etc. of these previously blind people have to be made whole. It also would be necessary miraculously to change many of their habitual patterns of thought.)

21. Some might object that if Hume's copy principle of idea acquisition and justification were mistaken, Hume could not have used it as a means of making important discoveries about causation, existence, substance and so on. My reply is that just as one sometimes can pound nails with a broken hammer, so also sometimes one can use a false philosophical principle to arrive at results that are true. Thus, what I have said about the copy principle does not necessarily imply the falsity of any other of Hume's doctrines.