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Tel: +49 +341 97 16174

Institute for Formal Ontology and Medical
Information Science
Universitaet Leipzig
Haertelstr. 16-18
DE-04107 Leipzig

Mail: maureen.donnelly@ifomis.uni-leipzig.de

USER-GROUP-1

Kontaktperson
Frau Dr. Maureen Donnelly
maureen.donnelly@ifomis.uni-leipzig.de

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DAVID AND STEPHANIE LEWIS

HOLES

Argle. I believe in nothing but concrete material objects.

Bargle. There are many of your opinions I applaud; but one of your less pleasing characteristics is your fondness for the doctrines of nominalism and materialism. Every time you get started on any such topic, I know we are in for a long argument. Where shall we start this time: numbers, colors, lengths, sets, force-fields, sensations, or what?

Argle. Fictions all! I've thought hard about every one of them.

Bargle. A long evening's work. Before we start, let me find you a snack. Will you have some crackers and cheese?

Argle. Thank you. What spendid Gruyère!

Bargle. You know, there are remarkably many holes in this piece.

Argle. There are.

Bargle. Got you!

* * *

Bargle. You admit there are many holes in that piece of cheese. Therefore, there are some holes in it. Therefore, there are some holes. In other words, holes exist. But holes are not made of matter; to the contrary, they result from the absence of matter.

Argle. I did say that there are holes in the cheese; but that is not to imply that there are holes.

Bargle. However not? If you say that there are A's that are B's, you are committed logically to the conclusion that there are A's.

Argle. When *I* say that there are holes in something, I mean nothing more nor less than that it is perforated. The synonymous shape-predicates '. . . is perforated' and 'there are holes in . . .'—just like any other shape-predicate, say '. . . is a dodecahedron'—may truly be predicated of pieces of cheese, without any implication that perforation is due to the presence of occult, immaterial entities. I am sorry my innocent predicate confuses you by sounding like an idiom of existential quantification, so that you think that inferences involving it are valid when they are not. But I have my reasons. You, given a perforated piece of cheese and believing as you do that it is perforated because it contains immaterial entities called holes, employ an idiom of existential quantification to say falsely 'There are holes in it'. Agreeable fellow that I am, I wish to have a sentence that sounds like yours

and that is true exactly when you falsely suppose your existential quantification over immaterial things to be true. That way we could talk about the cheese without philosophizing, if only you'd let me. You and I would understand our sentences differently, but the difference wouldn't interfere with our conversation until you start drawing conclusions which follow from your false sentence but not from my homonymous true sentence.[1]

Bargle. Oh, very well. But behold: there are as many holes in my piece of cheese as in yours. Do you agree?

Argle. I'll take your word for it without even counting: there are as many holes in mine as in yours. But what I mean by that is that either both pieces are singly-perforated, or both are doubly-perforated, or both are triply-perforated, and so on.

Bargle. What a lot of different shape-predicates you know! How ever did you find time to learn them all? And what does 'and so on' mean?[2]

Argle. Let me just say that the two pieces are equally-perforated. Now I have used only one two-place predicate.

Bargle. Unless I singly-perforate each of these crackers, how will you say that there are as many holes in my cheese as crackers on my plate? Be so kind as not to invent another predicate on the spot. I am quite prepared to go on until you have told me about all the predicates you have up your sleeve. I have a good imagination, and plenty of time.

Argle. Oh, dear . . . (ponders)

* * *

Argle. I was wrong. There *are* holes.

Bargle. You recant?

Argle. No. Holes are material objects.

Bargle. I expected that sooner. You are thinking, doubtless, that every hole is filled with matter: silver amalgam, air, interstellar gas, luminiferous ether or whatever it may be.

Argle. No. Perhaps there are no truly empty holes; but I cannot deny that there might be.

Bargle. How can something utterly devoid of matter be made of matter?

Argle. You're looking for the matter in the wrong place. (I mean to say, that's what you would be doing if there were any such things as places, which there aren't.) The matter isn't inside the hole. It would be absurd to say it was: nobody wants to say that holes are inside themselves. The matter surrounds the hole. The lining of a hole, you agree, is a material object. For every hole there is a hole-lining; for every hole-lining there is a hole. I say the hole-lining *is* the hole.

* * *

[1] *Cf.* W. V. Quine, 'On What There Is', *From a Logical Point of View*, 2nd edition (Cambridge, Mass.: Harvard University Press, 1961): 13.

[2] *Cf.* Donald Davidson, 'Theories of Meaning and Learnable Languages', in Y. Bar-Hillel, *Logic, Methodology and Philosophy of Science, Proceedings of the* 1964 *International Congress* (Amsterdam, 1965): 383-394.

Bargle. Didn't you say that the hole-lining surrounds the hole? Things don't surround themselves.

Argle. Holes do. In my language, 'surrounds' said of a hole (described as such) means 'is identical with'. 'Surrounds' said of other things means just what you think it means.

Bargle. Doesn't it bother you that your dictionary must have two entries under 'surrounds' where mine has only one?

Argle. A little, but not much. I'm used to putting up with such things.

Bargle. Such *whats?*

Argle. Such dictionary entries. They're made of dried ink, you recall.

Bargle. Oh. I suppose you'll also say that ' . . . is in . . .' or ' . . . is through . . .' said of a hole means '. . . is part of . . .'.

Argle. Exactly so, Bargle.

Bargle. Then do you still say that 'There are holes in the cheese' contains an unanalyzed shape-predicate synonymous with '. . . is perforated'?

Argle. No; it is an existential quantification, as you think it is. It means that there exist material objects such that they are holes and they are parts of the piece of cheese.

<p style="text-align:center">*   *   *</p>

Bargle. But we wouldn't say, would we, that a hole is made out of cheese?

Argle. No; but the fact that we wouldn't say it doesn't mean it isn't true. We wouldn't have occasion to say, unless philosophizing, that these walls are perpendicular to the floor; but they are. Anyhow we *do* say that caves are holes in the ground and that some of them are made out of limestone.

<p style="text-align:center">*   *   *</p>

Bargle. Take this paper-towel roller. Spin it on a lathe. The hole-lining spins. Surely you'd never say the hole spins?

Argle. Why not?

Bargle. Even though the hole might continue to be entirely filled with a dowel that didn't spin or move at all?

Argle. What difference does that make?

Bargle. None, really. But now I have you: take a toilet-paper roller, put it inside the paper-towel roller, and spin it the other way. The big hole spins clockwise. The little hole spins counter-clockwise. But the little hole is part of the big hole, so it spins clockwise along with the rest of the big hole. So if holes can spin, as you think, the little hole turns out to be spinning in both directions at once, which is absurd.

Argle. I see why you might think that the little hole is part of the big hole, but you can't expect me to agree. The little hole is inside the big hole, but that's all. Hence I have no reason to say that the little hole is spinning clockwise.

<p style="text-align:center">*   *   *</p>

Bargle. Consider a thin-walled hole with a gallon of water inside. The volume of the hole is at least a gallon, whereas the volume of the hole-

<p style="text-align:center">208</p>

lining is much less. If the hole is the hole-lining, then whatever was true of one would have to be true of the other. They could not differ in volume.

Argle. For 'hole' read 'bottle'; for 'hole-lining' also read 'bottle'. You have the same paradox. Holes, like bottles, have volume—or, as I'd rather say, are voluminous or equi-voluminous with other things—in two different senses. There's the volume of the hole or bottle itself, and there's the volume of the largest chunk of fluid which could be put inside the hole or bottle without compression. For holes, as for bottles, contextual clues permit us to keep track of which we mean.

*   *   *

Bargle. What is the volume of the hole itself? How much of the cheese do you include as part of one of these holes? And how do you decide? Arbitrarily, that's how. Don't try saying you include as little of the cheese as possible, for however much you include, you could have included less.

Argle. What we call a single hole is really many hole-linings. Some include more of the cheese, some include less. Therefore I need not decide, arbitrarily or otherwise, how much cheese is part of the hole. Many different decisions are equally correct.

Bargle. How can a single hole be identical with many hole-linings that are not identical with one another?

Argle. Really there are many different holes, and each is identical with a different hole-lining. But all these different holes are the same hole.

Bargle. You contradict yourself. Don't you mean to say that they all *surround* the same hole—where by 'surround' I mean 'surround', not 'be identical with'?

Argle. Not at all. I would contradict myself if I said that two different holes were identical. But I didn't; what I said was that they were the same hole. Two holes are the same hole when they have a common part that is itself a hole.

Bargle. You agreed before that there were as many holes in my cheese as crackers on my plate. Are there still?

Argle. Yes; there are two of each left.

Bargle. Two crackers, to be sure, but how can you say there are two holes?

Argle. Thus: there is a hole, and there is another hole that is not the same hole, and every hole in the cheese is the same hole as one or the other.

Bargle. Be so kind as to say 'co-perforated', not 'same', and stop pretending to talk about identity when you are not. I understand you now: co-perforation is supposed to be an equivalence relation among hole-linings, and when you say there are two holes you are trying to say that there are two non-identical co-perforation-classes of hole-linings. Really you identify holes not with hole-linings but with *classes* of hole-linings.

Argle. I would if I could, but I can't. No; holes are hole-linings; but when I speak of them as holes, I find it convenient to use 'same' meaning

209

'co-perforated' wherever a man of your persuasion would use 'same' meaning 'identical'. You know my reason for this trickery: my sentences about sameness of holes will be true just when you wrongly suppose your like-sounding sentences to be. The same goes for sentences about number of holes, since we both analyse these in terms of sameness.[3]

*   *   *

Bargle. You still haven't told me how you say there are as many holes in my cheese as crackers on my plate, without also saying how many there are.

Argle. Here goes. There exist three things X, Y, and Z. X is part of the sum of the crackers, Y is part of the cheese, and Z is part of Y. Every maximal connected part of Y is a hole, and every hole in the cheese is the same hole as some maximal connected part of Y. X overlaps each of the crackers and Z overlaps each maximal connected part of Y. Everything which is either the intersection of X and a cracker or the intersection of Z and some maximal connected part of Y is the same size as any other such thing. X is the same size as Z.[4]

*   *   *

Bargle. Your devices won't work because co-perforation is not an equivalence relation. *Any* two overlapping parts of my cheese have a common part that is a hole-lining, though in most cases the hole-lining is entirely filled with cheese. To be co-perforated is therefore nothing more than to overlap, and overlapping is no equivalence relation. The result is that although, as you say, you can find two hole-linings in this cheese that are not co-perforated, you can find another one that is co-perforated with both of them.

Argle. If you were right that a hole made of cheese could be entirely filled with the same kind of cheese, you could find far more than two non-co-perforated hole-linings; and there would be no such thing as cheese without holes in it. But you are wrong. A hole is a hole not just by virtue of its own shape but also by virtue of the way it contrasts with the matter inside it and around it. The same is true of other shape-predicates; I wouldn't say that any part of the cheese is a dodecahedron, though I admit that there are parts—parts that do not contrast with their surroundings—that are *shaped like* dodecahedra.

Bargle. Consider the paper-towel roller. How many holes?

Argle. One. You know what I mean: many, but they're all the same.

Bargle. I think you must say there are at least two. The left half and the right half are not the same hole. They have no common part, so no common part that is a hole.

Argle. They're not holes, they're two parts of a hole.

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[3] *Cf.* Quine's maxim of identification of indiscernibles in 'Identity, Ostension, and Hypostasis', *From a Logical Point of View:* 71; P. T. Geach, 'Identity', *Review of Metaphysics* 21 (1967): 3-12.

[4] This translation adapts a device from Nelson Goodman and W. V. Quine, 'Steps toward a Constructive Nominalism', *Journal of Symbolic Logic* 12 (1947): 109-110.

Bargle. Why aren't they holes themselves? They are singly-perforated and they are made of matter unlike the matter inside them. If I cut them apart you'd have to say they were holes?

Argle. Yes.

Bargle. You admit that a hole can be a proper part of a bigger—say, thicker-skinned—hole?

Argle. Yes.

Bargle. You admit that they are shaped like holes?

Argle. Yes, but they aren't holes. I can't say why they aren't. I know which things are holes, but I can't give you a definition. But why should I? You already know what hole-linings are. I say the two halves of the roller are only parts of a hole because I—like you—would say they are only parts of a hole-lining. What isn't a hole-lining isn't a hole.

Bargle. In that case, I admit that co-perforation may be an equivalence relation at least among singly-perforated hole-linings.

Argle. All holes are singly-perforated. A doubly-perforated thing has two holes in it that are not the same hole.

Bargle. Are you sure? Take the paper-towel roller and punch a little hole in its side. Now you have a hole in a hole-lining. You'd have to say you have a hole in a hole. You have a little hole which is part of a big hole; the big hole is not singly-perforated; and the little hole and the big hole are the same hole, since the little hole is a common part of each.

Argle. I think not. You speak of *the* big hole; but what we have are two big holes, not the same, laid end to end. There is also the little hole, not the same as either big hole, which overlaps them both. Of course we sometimes call something a hole, in a derivative sense, if it is a connected sum of holes. Any decent cave consists of many holes that are not the same hole, so I must have been speaking in this derivative sense when I said that caves are holes.

Bargle. What peculiar things you are driven to say when philosophy corrupts your mind! Tell me the truth: would you have dreamt for a moment of saying there were two big holes rather than one if you were not suffering under the influence of a philosophical theory?

Argle. No; I fear I would have remained ignorant.

Bargle. I see that I can never hope to refute you, since I no sooner reduce your position to absurdity than you embrace the absurdity.

Argle. Not absurdity; disagreement with common opinion.

Bargle. Very well. But I, for one, have more trust in common opinions than I do in any philosophical reasoning whatever. In so far as you disagree with them, you must pay a great price in the plausibility of your theories.

Argle. Agreed. We have been measuring that price. I have shown that it is not so great as you thought; I am prepared to pay it. My theories can earn credence by their clarity and economy; and if they disagree a little with

common opinion, then common opinion may be corrected even by a philosopher.

Bargle. The price is still too high.

Argle. We agree in principle; we're only haggling.

Bargle. We do. And the same is true of our other debates over ontic parsimony. Indeed, this argument has served us as an illustration—novel, simple, and self-contained—of the nature of our customary disputes.

Argle. And yet the illustration has interest in its own right. Your holes, had I been less successful, would have punctured my nominalistic materialism with the greatest of ease.

Bargle. Rehearsed and refreshed, let us return to—say—the question of classes.[5]

University of California
Los Angeles

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[5] There would be little truth to the guess that Argle is one of the authors and Bargle is the other. We thank Charles Chastain, who also is neither Argle nor Bargle, for many helpful comments.