Communities of Logical Practice

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Etienne Wenger's Communities of Practice

The term *practice* . . . denotes a set of socially defined ways of doing things in a specific domain: a set of common approaches and shared standards that create a basis for action, communication, problem solving, performance and accountability. These communal resources include a variety of knowledge types: cases and stories, theories, rules, frameworks, models, principles, tools, experts, articles, lessons learned, best practices, and heuristics. They include both the tacit and the explicit aspects of the community's knowledge. . . . It also embodies a certain way of behaving, a perspective on problems and ideas, a thinking style, and even in many cases an ethical stance. In this sense, a practice is a sort of mini-culture that binds the community together.

Wenger, E. & al. (2002). *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Harvard Business School Press, pp. 38 f.

Systems of Logic

John Corcoran's Threefold Classification:

logistic systems classified by their logical truths;

consequence systems classified by the arguments they validate;

deductive systems classified by the proofs they admit.

Corcoran, J. (1969). Three logical theories. *Philosophy of Science*, 36:153–177.

Shared adherence to a logical system in any of these senses is neither necessary nor sufficient for community of logical practice

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Defeasible Modus Ponens

As a rule, if P, then Q.
P.
It is not the case that there is an exception to the rule that if P, then Q.
Therefore, Q.

Walton, D., Reed, C., and Macagno, F. (2008). *Argumentation Schemes*. Cambridge University Press, p. 366

Argumentation Scheme for Argument from Analogy

Similarity Premise Generally, case C_1 is similar to case C_2.

Base Premise A is true (false) in case C_1.

Conclusion A is true (false) in case C_2.

Critical Questions:

1. Are there differences between C_1 and C_2 that would tend to undermine the force of the similarity cited?
2. Is A true (false) in C_1?
3. Is there some other case C_3 that is also similar to C_1, but in which A is false (true)?

Walton, D., Reed, C., and Macagno, F. (2008). *Argumentation Schemes*. Cambridge University Press, p. 315

Consequentia Mirabilis . . .

If P is false, then P is true.
Therefore, P is true.

Gerolamo Saccheri:

'a very beautiful way of proving these same truths without any assumption'

Girolamo Cardano:

'the most wonderful thing that has been discovered since the beginning of the world'

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. . . and Seventeenth Century Jesuits

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Almost certainly the source of [Saccheri's] inspiration was [an annotation in] the widely read edition of Euclid published in 1574 by Clavius . . . And his attention may have been directed to the relevant scholium by his Jesuit teachers. For Clavius himself had belonged to the Society of Jesus, and it seems that the argument on which he wrote his comment had a vogue among the members in the seventeenth century as the *consequentia mirabilis*

Kneale, W. & Kneale, M. (1962). *The Development of Logic*. Clarendon, pp. 346 f.

Euclid & Contraposition

"*Hypothesis.* Let there be any number of propositions or assertions—three for instance, X, Y and Z—of which it is the property that one or the other must be true, *and one only*. Let there be three other propositions P, Q and R of which it is also the property that one, and one only, must be true. Let it be a connexion of those assertions that :

when X is true, P is true,
when Y is true, Q is true,
when Z is true, R is true.

Consequence : then it follows that,

when P is true, X is true,
when Q is true, Y is true,
when R is true, Z is true."

De Morgan, A. (1847). *Formal Logic*, cited in Heath, T. L. (2006). *The Thirteen Books of Euclid's Elements*. Barnes & Noble, p. 132

Euclid & Contraposition

To apply this to the case before us, let us denote the sides of the triangle ABC by a, b, c, and the angles opposite to these sides by A, B, C respectively, and suppose that a is the base.

Then we have the three propositions,

when b is equal to c, B is equal to C, [I. 5]

when b is greater than c, B is greater than C,
when b is less than c, B is less than C, } [I. 18]

and it follows *logically* that,

when B is equal to C, b is equal to c, [I. 6]

when B is greater than C, b is greater than c,
when B is less than C, b is less than c. } [I. 19]

Heath, T. L. (2006). *The Thirteen Books of Euclid's Elements*. Barnes & Noble, p. 133

Euclid & Superposition

Common Notion 4.

Καὶ τὰ ἐφαρμόζοντα ἐπ' ἄλληλα ἴσα ἀλλήλοις ἐστίν.
Things which coincide with one another are equal to one another.

Heath, T. L. (2006). *The Thirteen Books of Euclid's Elements*. Barnes & Noble, p. 72

One figure may be superposed on another so that its vertices and edges perfectly coincide.
Therefore, the two figures are identical.

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same time, it is clear that Euclid disliked the method and avoided it wherever he could, e.g. in I. 26, where he proves the equality of two triangles which have two angles respectively equal to two angles and one side of the one equal to the corresponding side of the other. It looks as though he found the method handed down by tradition (we can hardly suppose that, if Thales proved that the diameter of a circle divides it into two equal parts, he would do so by any other method than that of superposition), and followed it, in the few cases where he does so, only because he had not been able to see his way to a satisfactory substitute. But seeing how much of the *Elements* depends on I. 4, directly or indirectly, the method can hardly be regarded as being, in Euclid, of only subordinate importance; on the contrary, it is fundamental. Nor, as

Heath, T. L. (2006). *The Thirteen Books of Euclid's Elements*. Barnes & Noble, p. 73

Oliver Heaviside's Operational Calculus

So there you are, with an equivalence between one type of formula and another. That one of these should be sometimes divergent is an observational fact; that it should be numerically equivalent to the other when calculated in a certain way is an experimental fact; so is the different range of the practicability of the two solutions in general, and the overlapping region. And no doubt the logic of it all will have to be found out experimentally. And then, finally, I suppose "rigorous" mathematicians will put the logic at the beginning, and pretend they knew all about it before they began.

Heaviside, O. (1971). *Electromagnetic Theory*. Chelsea, vol. 3, p. 370.

Heaviside on Logic

I seem to be running down logic. I do not mean to. But there is logic *and* logic. There is narrow-minded logic confined within narrow limits, rather conceited, and professing to be very exact, with absolutely certain premisses. And there is a broader sort of logic, more common-sensical, wider in its premisses, with less pretension to exactness, and more allowance for human error, and more room for growth.

Heaviside, O. (1971). *Electromagnetic Theory*. Chelsea, vol. 3, pp. 516 f.

The Azande

1. All and only witches have witchcraft-substance.
2. Witchcraft-substance is always inherited by the same-sexed children of a witch.
3. The Zande clan is a group of persons related biologically to one another through the male line.
4. Man A of clan C is a witch.

$\therefore$ Every man in clan C is a witch.

R. C. Jennings's reconstruction of Evans-Pritchard, in da Costa, N. C. A., & al. (1998). Is there a Zande logic? *History and Philosophy of Logic*, 19, p. 42

Wikipedian Synthesis

Synthesis of published material that advances a position

Editors should not make the mistake of thinking that if A is published by a reliable source, and B is published by a reliable source, then A and B can be joined together in an article to reach conclusion C. This would be a synthesis of published material that advances a new position, and that constitutes original research. "A and B, therefore C" is acceptable only if a reliable source has published the same argument in relation to the topic of the article.

http://en.wikipedia.org/wiki/Wikipedia:SYN

Godwin's Law

Godwin's Law of Nazi Analogies:

As an online discussion grows longer, the probability of a comparison involving Nazis or Hitler approaches one.

Godwin, M. (1994). Meme, counter-meme. *Wired*, 2(10), p. 85

Godwin's Law is often stated as an explicitly argumentational norm, stipulating that the first person to mention Hitler has lost the argument. As such it may be understood as mandating an answer to the first critical question for the Argumentation Scheme for Argument from Analogy: for most domains, there are *always* differences between C_1 and C_2 that tend to undermine the force of the similarity cited, when C_2 is Hitler.

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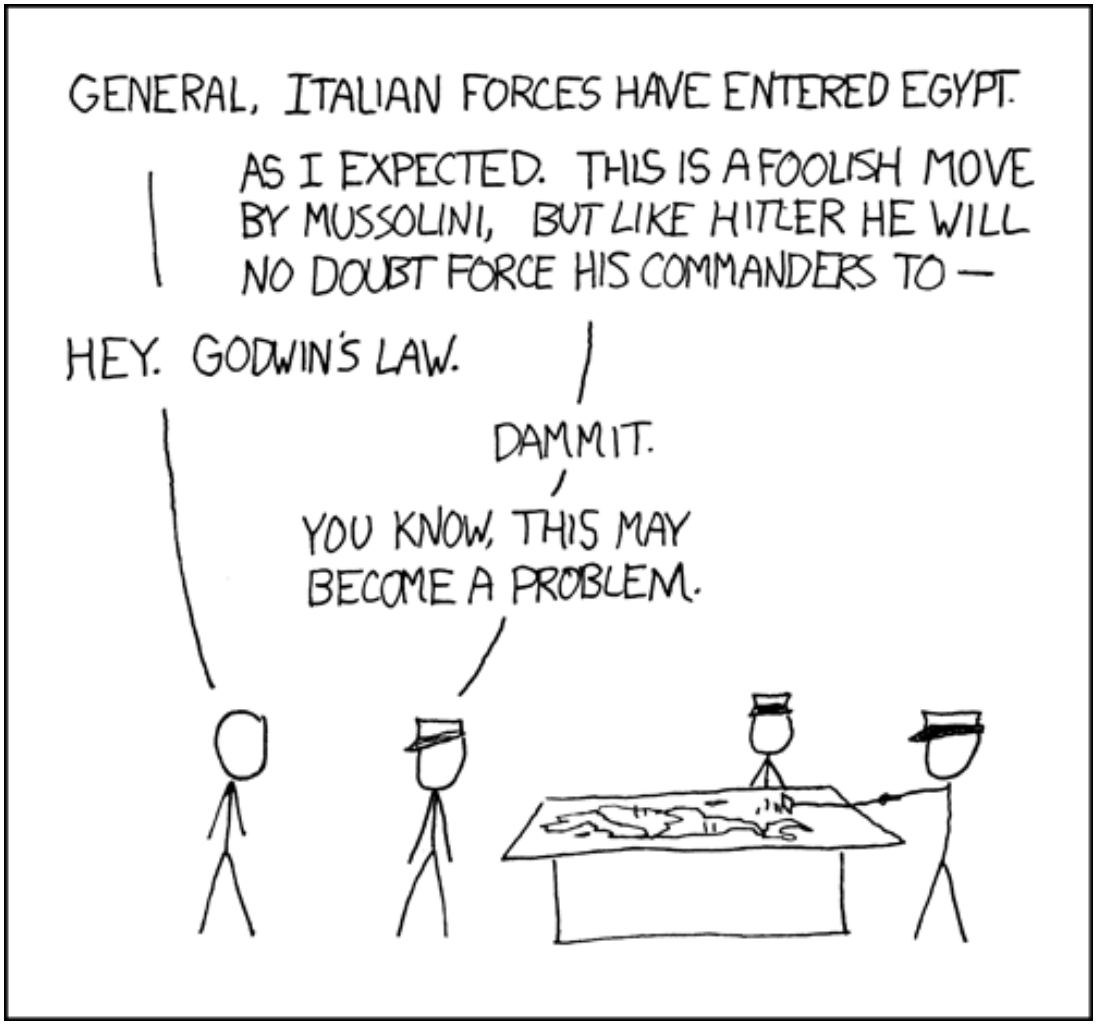

http://xkcd.com/261/

Conclusion

A satisfactory account of a community of logical practice should itemize the schemes employed within the practice, but it should also:

1. track frequency of use for the schemes (including those omitted altogether), paying particular attention to schemes whose use is disproportionate to that in comparable practices;
2. record information, explicit or tacit, about preferences amongst the community with regard to specific schemes;
3. relate each scheme to the context(s) of dialogue employed by the community;
4. where possible, observe how the practice changes with time.

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