

ific skills associated with informal logic. The test we are employing is the Watson-Glaser Critical Thinking Appraisal.¹ It is being given in one version as a 'pre-test' at the beginning of the course and as a 'post-test' at the end. The difference in student performance on these two versions will provide some measure of the effectiveness of the course in meeting its goals. (We are planning to establish a control group of students who will take the test, but who will not be taking the course, as a way of making this a more accurate measure.) The data collected should be very helpful in persuading our more empirically minded colleagues of the effectiveness of this informal logic course. Additionally, it will provide valuable information to both the instructors and students.

Informal logic will also have application in the Integrative Component of our new general education program. In terms of the understanding of 'integration', here (obviously there are many complex issues in this approach to learning and education) our program interprets the concept as a process concept going well beyond the idea of mere 'relatedness' which sometimes characterize attempts at integrative learning. In order to underscore this distinction, the program directs faculty who wish to teach courses in this component to specify the 'mechanism' of integration to be employed. The philosophy faculty believe that informal logic can serve admirably as just such a mechanism and that it can be employed for that purpose in a very wide variety of academic contexts. To give but one example: A program now being prepared for this component by Dr. Charles Krecz of our department, will be concerned with religion. It will involve a course in each of: the philosophy of religion, the sociology of religion and an anthropology course in primitive religion, as well as an informal logic course which will concentrate on methodology, structure of exposition, analysis of types of reasoning, etc. of each particular discipline's approach to the study of religion as well as analysis of reasoning in religion drawing from the data provided by the material in the other courses.

Other areas in which informal logic can serve as the mechanism of integration might include "technology and values," "the arts and environment" and so on. In fact the possibilities are about as great as the imagination and interest of faculty and students. Of course such an approach has the further advantage for those interested in informal logic of exposing them to a variety of different areas where the special characteristics of reasoning in those areas can be analyzed. Such contact should help maintain vigor and 'freshness' in informal logic.

Obviously many campuses will not be able to move in the precise directions we have. However, I hope I have illustrated the fruitfulness of looking for ways in which interest in informal logic can be pursued in the context of the debate on general education.

critical reviews

CHALLENGE & RESPONSE Carl Wellman

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This book was published in 1971. It has not received very much attention from philosophers, possibly because Rawls' Theory of Justice, published almost at the same time, preoccupied many of those interested in moral philosophy. Challenge and Response deserves more attention than it has received, I think, and it certainly merits careful study by those interested in informal logic. Wellman sets out to answer the meta-ethical question 'how can moral judgments be justified?', but before approaching that question, raises the prior one: 'what is justification?' The first half of his book is devoted to answering this general question, and, as such, contains much which is relevant to theorists of argument.

After some one hundred and thirty pages of close argument, Wellmann arrives at his view of what justification amounts to:

In my view justification is to be understood essentially as a process of responding to challenges made. It may be observed and described as a psychological struggle in which one person tries to force another to back down, or one person struggles to come to terms with his own doubts and conflicting convictions. But it is more than a psychological struggle because at its core are certain critical claims to truth, validity, to be upsetting, to be reassuring, and to be adequate. Therefore the actual outcome of any particular psychological struggle never settles once and for all the issues being fought over in the process of justification. It is this peculiar ambivalence of justification that enables what we actually do in discussion and thinking to serve as a test of critical ideals like truth, validity, and being justified. (pages 132-3)

Much justification (though not all, in Wellman's view) proceeds by argument. Wellman has some novel and interesting things to say about arguments and arguing, and it is to these that I'll devote most of my attention here. He maintains that there are legitimate arguments which are neither inductive nor deductive (he

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names them 'conductive'); redefines "valid"; endorses the notion of nonformal validity; defines "induction" in an original way; relates the notion of burden of proof to old-fashioned discussions of rules for directing the mind; and takes on the hoary problem of missing premises. Obviously this is a rich source; I cannot discuss all these topics here.

First of all: deductive, inductive, and conductive. As Perry Weddle has argued¹, definitions of "inductive" and "deductive" are so unsatisfactory that it seems premature to ask whether all arguments fall into one of these two categories. Anyone who tells us that there are arguments which are not either deductive or inductive had better clarify his position by explaining what he takes inductive and deductive arguments to be. Wellman's definition of deductive argument is fairly traditional:

Deduction is that form of reasoning in which the claim is made that the conclusion follows necessarily from the premises. If it is possible for the premises to be true and the conclusion false, then the argument is invalid; if the truth of the premises is a sufficient condition for the truth of the conclusion, then the argument is valid. (page 4) [my emphasis]

His definition of inductive argument, however, is not.

By "induction" I mean that sort of reasoning by which a hypothesis is confirmed or disconfirmed by establishing the truth or falsity of its implications. To show that the consequences of some hypothesis are true is to provide evidence for its acceptance; to show that one or more of its consequences are false is to refute it. It is this sort of reasoning, so important to science, to which I refer by the word "induction". (page 33)²

In the definition of deduction, the phrase "in which the claim is made" will give rise to problems. For typically, that 'claim' will not be explicitly expressed, and we will have to judge whether the premises are supposed to make it impossible for the conclusion to be false, or whether some looser connection is intended. Often this will be difficult. Consider:

It is the singular feature of such ethnic explanation (of poverty) that it is all but exclusively confined to conversation. The reputable scholar unhesitatingly adverts to it in casual interchange but rarely if ever puts it in his books or even his lectures. What is wholly plausible in conversation is wholly impermissible in print. There is obviously something odd about an explanation of poverty and well-being that must be so discreetly handled. (from Galbraith, The Nature of Mass Poverty, pages 14-15)

Galbraith is arguing from the absence of this form of explanation in print and in lectures to its being an odd explanation. Does his argument 'involve the claim' that the premise makes it impossible for the conclusion to be

false? It's hard to know what to say in response to this question. The same situation arises with:

. . . the combination of science and intellectual history is an unusual one. Initially it may therefore seem incongruous. But there can be no intrinsic incongruity. Scientific concepts are ideas and as such they are the subject of intellectual history. (from T. S. Kuhn, The Copernican Revolution, page vii.)

Discriminating deductive arguments from others on the basis of what connective claim 'is made' isn't easy, and here Wellman shares difficulties with logical tradition.

Standard textbook accounts define deduction as Wellman did, and then go on to define inductive arguments as those which 'involve' or 'make' the lesser claim that premises only make the conclusion more likely or probable. In these accounts, the full weight of the inductive/deductive distinction falls on the matter of the claim made (implicitly) in the argument. Also the inductive category looks like a bit of a grab-bag; inductive arguments are just all those arguments which aren't deductive. In view of these facts, Wellman's rather different account of induction is worth studying.

Inductive arguments, for Wellman, will be those arguments for or against hypotheses, from the confirmation or disconfirmation of those hypotheses in specific instances. Thus, 'these 100 crows are black, so all crows are black' would qualify as an inductive argument. Also, as Wellman points out, scientific reasoning is frequently inductive in his sense; particular observations and experiments are brought to bear on more general hypotheses. Induction in some sense is still widely thought to be the method of science, and most inductive logics deal exclusively with scientific confirmation and disconfirmation. Where Wellman's definition starts to have non-traditional consequences is in its permission of a priori induction³. Reasoning for or against general ethical principles on the basis of conclusions about specific instances would count as induction. If we were to argue, contra Kant, that lying is not always wrong, because it would be permissible to lie in order to save a life, we would be using an inductive argument, in Wellman's sense of "induction".

Ethical theories, just like scientific ones, have specific consequences for particular cases. If these consequences are found to be true, this confirms the theories. If they are found to be false, the theories are disconfirmed. However differently the consequences may be found to be true or false, the truth or falsity that is found has the same logical relation to the hypothesis of which it is a consequence. Therefore, inductive reasoning has its place in ethics just as it has in science. The logic of science is also the logic of ethics; the confirmation and disconfirmation of hypotheses is common ground. (page 44)

On the other hand, some arguments which tradition would call inductive do not seem to be inductive by Wellman's definition. Consider:

I've been a Supreme Court justice for 25 years, and never have I known any Supreme Court justice to divulge to a journalist the vote on any court case. If this journalist says that a justice told him there was a 5-4 split on the Stephen Truscott case, he must be lying.⁴

This argument is of the type 'never in my experience, X; therefore not X in this case'. It is much like 'never has the sun failed to rise, so it will surely rise tomorrow', and would surely count as inductive according to logical tradition. Yet the argument appears not to be inductive in Wellman's sense, for it applies a general hypothesis to a particular case, rather than moving from a case or cases to a hypothesis.

I shall not pursue this matter further, for, given the problems which have been found to arise in standard accounts of inductive and deductive arguments it does not count as much of a criticism of Wellman's distinction to point out that his rather novel definition of "induction" fails to include all the old examples as inductive. His definition preserves a link between induction and science, and between the relation between confirmed/disconfirmed particular judgments and a general hypothesis. However, it allows for non-empirical induction and may fail to classify some probabilistic arguments as inductive. Also, it does not distinguish inductive from deductive arguments in such a way as to make the distinction one which is by definition exhaustive. This last innovation strikes me as an advantage, but others may not see the matter this way.

On the standard notion of inductive arguments as all those based on anything less than logical entailment as a connection between premises and conclusion, the argument 'you should meet me at 2:00 because you promised to do so' would be inductive.⁵ Yet such an argument seems to have nothing of importance in common with 'these observed crows were all black; so all crows are black'. The moral argument is of the type Wellman has termed 'conductive'. The conductive argument, he says:

derives its conclusion from a variety of premises each of which has some independent relevance. Typically, although by no means always, several reasons are given in such arguments; and in those cases where a single reason is advanced, there are others which might have been given as well. Since what is characteristic of this sort of reasoning is the leading together of various considerations, it seems appropriate to label it "conduction". (page 52) [my emphasis]

This type of reasoning has also been noticed by Michael Scriven and Stephen Thomas who, like Wellman, emphasize that premises bear separately on the conclusion in such a way that the falsity of one does not affect the pertinence of others.⁶

In conductive arguments, typically several factors relevant to the conclusion are cited in the premises, and the conclusion is then drawn. Examples:

1. "You ought to take your son to the movie because you promised to do so, it is a good movie, and you have nothing better to do this afternoon." (Wellman, page 56)
2. "This is not a good book because it fails to hold one's interest, is full of vague descriptions, and has a very implausible plot." (Wellman, page 56)
3. "Hume is not a sceptic, for although he argues that our basic beliefs are not rationally justified, he rails against classical sceptics, and maintains that we are as much determined to believe as we are to think and feel." (My example)
4. "We can be proud that America has turned the corner on the depression of the last few years. At last the many indexes of recovery are showing optimistic readings. The rate of inflation has slowed, unemployment has more or less stabilized, inventories are beginning to drop, advance orders are starting to pick up, and--the best news of all--the average income figures are showing a gain. The doomsayers have been discomfited, and the free enterprise system once more vindicated." (Scriven, Reasoning, page 78)

Wellman has a tendency to concentrate on examples which he has contrived and which are solely from the domain of moral arguments. In doing this, I think he does his own case an injustice, and it is for this reason that I've included other examples above. Wellman wishes to make the case that conductive arguments are legitimate arguments which can serve to justify claims, and that where these arguments are used in support of moral judgments, they deserve to be taken seriously as rational instruments. Since his ultimate interest is in meta-ethics, it is natural for him to concentrate on moral arguments; however, he would make a more solid case by showing that conductive reasoning and conductive arguments are widely used, and insisting that they are as legitimate in moral reasoning as elsewhere.⁷

The conductive argument is one in which the premise, or premises, are each separately relevant to the conclusion, though none is sufficient to show its truth. In example (2) above, three quite separate reasons are given for thinking a book to be a poor one. Each aspect cited would be such as to make the book poor (i.e. relevant to thinking it poor), even in the absence of the other two. The three cumulate, so that good reason is given to think the book a poor one. In example (3), one factor is cited which would count towards Hume being a sceptic, and two others which would count against that. The latter two are supposed to outweigh the first one so that the argument overall presents good reason to believe that Hume is not a sceptic. The key notion for the conductive argument seems to be that of relevance, that kind of relevance which is less than full entailment. In support of a conclusion many relevant factors can be brought forward, some

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counting for it, others counting against it. Much reasoning involves bringing these together and 'weighing' them to see which conclusion it is most reasonable to accept. A conductive argument may be the product of such reasoning; this kind of argument will involve the specification of several such factors and adduce a conclusion on the basis of their cumulative force.⁸

There are many conductive arguments among real life arguments. Their prevalence may help to explain several student assumptions which appeared to me at first to be peculiar and funny, and which are inappropriate as applied to classically deductive and inductive arguments. Students, I've found, often believe that the more premises an argument has, the better it is. They find it almost impossible to believe, often, that an argument with only one premise could be a good argument. (If an argument has more premises, such students will insist, then it offers more reasons for its conclusion.) This line of thinking is appropriate for conductive arguments. Also, some students show a strong inclination to analyze arguments by setting out the premises and the conclusion and then proceeding to criticize connections as though each premise, separately considered, was supposed to lead to the conclusion. This critical strategy is often wholly wrong, but would be more or less appropriate for conductive arguments.

Wellman admits that since relevance is a content-dependent notion, there is little, if anything, of a formal or even a general nature which can be said about conductive arguments. They exist and they may be assessed (by 'thinking them through again'), though not formally. Wellman has a close discussion of the view--fairly common among philosophers--that validity must be formal and must be demonstrable by the application of formal rules of inference. He rejects this view for various reasons, most importantly because formal rules must derive from and be testable by, nonformal, extra-systematic judgments of validity.

surely the existence of valid reasoning does not presuppose the existence of any such calculus of derivation rules, for the inferences formalized by Hilbert and Ackerman, say, were valid before they invented their logical system just as the syllogism was valid long before Aristotle. As a rule, the logician tries to construct his calculus so that it will reflect some sort of reasoning that is recognized to be valid independently of his system. To be sure, the inventive logician can think up queer logics which suggest new, and sometimes strange, ways of reasoning. But if these queer logics become too queer, they are no longer considered logics, but only symbolic games of some similar sort. This indicates that even here, our standards of validity are outside of and independent of the derivation rules in any uninterpreted calculus. (page 75)9

This point, strongly emphasized by such theorists of logic as Arthur Pap and Susan

Haack, seems to me to be entirely correct. Connections which exist between premises and conclusions are not the products of logical systems, but rather are presupposed by those systems. Validity is not by definition formally valid; connections need not be formally articulable in order to exist. There is room, then, for the idea of a legitimate connection between the premises and conclusion of conductive arguments, even though this connection is most unlikely to be formally capturable. Though it may be true, as Wellman anticipates it will be, that there is little of a systematic nature which can be said about conductive arguments, that is no reason to deny their existence, or to deny them any sort of validity.

Wellman's innovation on 'inductive' and his defense of the notion of conductive argument strike me as the most significant aspects of his book for those interested in informal logic and, accordingly, I have described these at some length. There is much else that is pertinent and for other topics I shall be considerably more brief.

There is the matter of validity. Wellman eventually develops an umbrella notion of validity which applies to arguments of all types:

If it is granted that inductive and conductive arguments cannot be reduced to deductive form and that they are subject to logical criticism, then it must be admitted that there is a genuine sense in which these arguments are valid or invalid. By logical criticism I mean the judgment of correctness or incorrectness as inferences, as drawing a conclusion from one or more premises, quite apart from any question of the truth of the premises. Once deductivism is abandoned, the need for this broader conception of validity becomes apparent. (page 240)

His proposal for 'valid' is: to say that an argument is valid is to say that it is persuasive after indefinite criticism for all those who think in the normal way. 'Indefinite' criticism is required so that the notion of validity is not purely descriptive; 'the normal way' so that the failure of an argument to convince lunatics does not brand it invalid. Thinking in the normal way means "having a tendency to be persuaded by some sort of arguments and not by other sorts . . . most men are similarly persuaded or unpersuaded". There seem to be dangers of circularity here.

Wellman also seems to be in some trouble with the question of whether an argument with false or unwarranted premises can be valid in his sense--can it be persuasive?

What are the conditions of persuading? That the person to be persuaded accepts or has the premises of the argument, that he rejects or doubts its conclusion, and that he pays

attention to or thinking through the argument. . . . to say that an argument is persuasive is to say that it usually persuades one who accepts or has its premises, who rejected or doubted its conclusion

just before being subjected to the argument, and who thinks through the argument. (page 91)

What about one who rejects the premises of an argument? Can the argument be persuasive to him? It must be found 'persuasive after indefinite criticism' to qualify as valid in the new sense. Yet since the account of persuasiveness is in terms of one who accepts the premises, it is hard to see how Wellman can achieve what he wants, namely an umbrella way of speaking of the connection between premises and conclusions which is independent of considerations of the truth or falsity of premises. He tries to fix the account, saying:

a person who does not accept the premises of a given argument can still imagine what it would be like to accept them and make a good guess as to whether they would then persuade one of the conclusion. (page 109)

I am not sure this is good enough.

A more fundamental question is whether such an umbrella notion of validity, involving as it does a fundamental departure from tradition in logic, is desirable. S. N. Thomas, in his text, takes the position that 'validity' applies to arguments of all types and is a matter of degree. So Wellman isn't the only one suggesting radical changes. Personally I'm not sure I favor innovations here, as deductive validity is an established and relatively clear concept. Perhaps some new term could be adopted to handle the 'umbrella' aspect, and then deductive validity would be a species of this connectedness of premises and conclusion. Wellman points out that the ordinary language use of 'valid' is broader than the logicians', and this seems to be true--however the ordinary language use is so broad as to move towards considerations of truth as well. (E.g. "that's a valid point you made ...")

Another key topic discussed by Wellman is the matter of missing premises. This problem is not discussed in any general way; however Wellman becomes involved in it when introducing his notion of a conductive argument. He is aware that, given a move from a particular premise to a particular conclusion, many will insist that the argument must be enthymematic, so that there is a general premise missing. Descartes ran into this problem when some critics insisted that 'I think therefore I am' was really a syllogism requiring as a missing premise 'everything that thinks exists.'¹⁰ Descartes denied it; Wellman does too.

Consider the simple conductive argument: 'you should return the book, because you promised you would do so'. Someone might insist that this argument is enthymematic, requiring a missing premise--e.g. 'People should do everything they promise to do'. Such insistence turns conductive arguments into deductive ones and makes reasoning about particular instances dependent upon the acceptance of general principles. Wellman strongly resists the move, saying that the universal premise inserted is almost always false, or at any rate less plausible than the particular inference which the arguer wants

to draw, and that it is not fair interpretation to saddle people with general claims when all they have set out to do is to draw particular inferences. We often want to do this, but perhaps this is only because we are so strongly inclined, by training, to look at arguments through deductivist goggles.

Turning conductive arguments into deductive ones grossly distorts their meaning and structure, for deductive arguments are supposed to be conclusive. A conductive argument, citing three factors relevant to the establishment of a conclusion, would turn into three deductive arguments, each of which, as conclusive, would render the other two entirely redundant. This point seems to me to be an important one, and one which would apply to much philosophical argumentation. (If proponents of (e.g.) the mind/brain identity theory really think that their arguments for the theory are deductive, why would they need more than one?)

A fault which runs throughout Wellman's account is the failure to distinguish between reasoning and arguments. Despite his general carefulness, Wellman seems to make this relationship too close, identifying reasoning with putting forward or following through one or more arguments. But there is the process of argument construction, where one sifts through evidence, tries to determine what is relevant and what isn't . . . and all of this, which precedes the expression of an argument, is on most accounts recognized as reasoning. I don't think there is any crucial problem here, and I've simply tried to use 'argument' in contexts where Wellman speaks of reasoning, but is pretty clearly dealing with the arguments that are the product of reasoning. The point is of some importance, however, for critics might be tempted to allow that such reasoning is conductive, but deny that there is such a thing as conductive argument. I don't think this criticism is very plausible, in the light of the many examples of conductive arguments which can easily be found in natural language.

The book covers much which I've not discussed. I shall finish where I began, by urging others interested in informal logic to study this rich source.

Footnotes

1. In the last issue of Informal Logic Newsletter, (November, 1979).
2. This passage exemplified Wellman's tendency to very closely relate reasoning and argument. As he is clearly talking about kinds of argument in this context, I've dealt with these and not with the question (much broader) of what different kinds of reasoning there might be.
3. There is a connection here with the concept of reflective equilibrium, made fashionable by Rawls. Many moral philosophers now accept what Wellman refers to as induction in morals, though they would add that views on particular cases may also be revised by theoretical principles which are in some sense or other well-established. The analogy which Wellman wishes to draw between ethical and scientific reasoning also seems to be quite a widely accepted one in current moral

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philosophy. (Note: this is not a fallacious appeal to authority, but merely a point of information!)

4. Adapted from an argument in the Toronto Globe and Mail, appearing sometime in January, 1980.
5. That is, unless we insist on adding as a missing premise, 'You should do everything you promise to do', in which case the argument is deductive.
6. See Scriven, Reasoning, pages 78-81, and Thomas, Practical Reasoning in Natural Language, pages 37-40.
7. He does note that the concept of conductive argument has wider application, saying, "Wherever some descriptive predicate is ascribed on the basis of a family resemblance, conductive reasoning takes place." (page 54). But he does not make enough of this point, nor does he tell us how many descriptive predicates are ascribed on the basis of family resemblance. (If most are, as Wittgenstein seems to have thought, then conductive reasoning would be very common, and conductive arguments an extremely important type. Compare D. C. Yalden-Thomson, "The Virginia Lectures", in Wisdom: Twelve Essays, edited by Renford Bambrough.)
8. Wellman specifies three different patterns of conductive argument; one where only one relevant factor is adduced; one where several are adduced; and a third where both 'pro' and 'con' factors are adduced, and the claim is made that the former outweigh the latter.
9. Compare Susan Haack, Philosophy of Logics, Chapter II.
10. See Objections to the Meditations (II), and Descartes' reply, in which he insists that a general proposition is not required and that, indeed, "general propositions are formed out of the knowledge of particulars" (page 38, Volume II, in Haldane and Ross edition.) A similar response is made by Descartes in a letter to Clerseilier (page 127 in Haldane and Ross, II.)
11. Compare Francis Dauer, "The Diagnosis of an Argument", Metaphilosophy, 1974.

UNDERSTANDING SCIENTIFIC REASONING

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Suppose one could gather together about a hundred university professors of philosophy and suppose furthermore that they represented a fair sample of today's philosophers with respect to contemporary thinking about the teaching of logic and philosophy. To these people one now reads the first four paragraphs of Giere's Preface.

By the end of the reading the philosophers would have become decisively divided on their attitudes to the book. Giere speaks of "new courses in 'applied philosophy'", of the "students' demand for 'relevance'" and of his reluctant rejection of his idea of subtitling the book "A Consumer's Guide to Scientific Method". He claims that students can become intelligent consumers of scientific information not by learning science (or in his words "how to be scientists") but by learning

merely how to read and interpret reports of scientific findings, especially reports that appear in the popular magazines, newspapers, and even supermarket tabloids.

Some of our philosophers would denounce the book as "light weight", "not academically respectable" and condemn the book outright. The others would find that the book arouses their interest. This aroused interest may have three (possibly overlapping) sources: a) an awareness of the possibility that the book may form the basis of an attractive (pop?) class. b) On the basis of one's knowledge of today's students plus the nature of many media reports one may have concluded i) that most people know very little about science but that ii) they are prepared to believe the most outrageous stories provided these are in the realm of "science". Finally c) Giere's book appears to offer the opportunity to extend one's work in informal logic into the area of the logic of science, and reports about science in the media.

A cursory glance through the book reveals material that should arouse student interest. Giere's chapters deal with Haley's long-range forecast of the appearance of his comet, the World II model which uses a computer to predict disaster for mankind by the year 2100 unless great changes are made in the world socio-economic system by 1985. Additional (to informal logic) fallacies such as Vague Predictions (or the Delphi Fallacy), The Jean Dixon Fallacy (multiple predictions),