

Committee I  
Unity of the Sciences  
# 13

Draft-for Conference  
Distribution Only

**THE REDUCTIVE METHOD**

by

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on

William W. Bartley, III's  
**THE DIVISION OF KNOWLEDGE**

The Twelfth International Conference on the Unity of the Sciences  
Chicago, Illinois November 24-27, 1983

Paper for the 12th International Conference on the Unity of the  
Sciences, Committee I (first draft)

Chicago, Illinois, November 1983

The Reductive Method

or the source of the deceptions that attend opinions

based upon sense perceptions

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I have been asked by the organizing committee of this conference to act as a discussant of Professor Bartley's paper 'The Division of Knowledge'. But I find this a difficult task. I find it difficult as I agree with much of what Bartley has written. I could perhaps take up Bartley's criticism of Professor Paul Hirst and criticize some of Hirst's points of view with which I also either disagree or find confused. But not only do I agree with Bartley's criticism of Hirst, but I also think that Bartley has 'done the job' of criticizing Hirst. Consequently if I agree with Bartley's position then any comment on his paper per se would simply amount to an attempted verification of his paper. But the mainpoint of Bartley's paper, and of a Popperian approach to philosophy, is a rejection of verificationist and justificationist procedures. Therefore if I myself am not to be led into the verificationist trap then all I am able to do is to make a modest attempt to extend some of Bartley's arguments as I understand them.

Bearing in mind the topic of this committee, that is, the unity of the sciences, and also Bartley's position of criticizing

the disunity of the sciences, together with his belief in the unity of the underlying method of the sciences, I would like to consider a so called scientific method which its proponents consider logical, and I would like to try to argue that the assumptions of the method are based upon a position Bartley criticizes in his paper, namely, that of limited rationality.

The method I would like to discuss briefly forms the title of my paper, the so called reductive method of forming logical conclusions. This method has, I suggest, informed some philosophers, scientists and educationists in countries like the Federal Republic of Germany and the German Democratic Republic as well as in Latin American countries like Argentina (1). And I suggest that the acceptance of the reductive method is connected, in part, with the justificationist question 'How can the principle of induction be justified?'

I must point out immediately (lest the reader may be led to think that I have made some kind of discovery) that the reductive method is based upon a fallacy in traditional logic, that is, the Fallacy of Affirming the Consequent. The fallacy was identified by Aristotle over 2000 years ago and is formulated in his *De Sophisticis Elenchis* (167b) in the following way,

"For whenever, suppose A is, B necessarily is, they then suppose that if B is, A necessarily is. This is the source of the deceptions that attend opinions based upon sense perception. For people often suppose bile to be honey because it is attended to by a yellow colour: also, since after rain the ground is wet in consequence, we suppose that if the ground is wet, it has been raining; whereas that does not necessarily follow."

Reductivists assume a symmetry with the *modus ponens*. That is, not only do reductivists consider the argument

If A, then B  
A  
Therefore B

to be valid but also they assume the structure

If A, then B  
B  
Therefore A

Hence, according to the reductive schema Aristotle's example above would become

If it is raining outside then the ground is wet

The ground is wet

Therefore it is raining outside

The illogicality of the argument is so obvious it is almost trivial. That is, the ground outside may be wet because a street cleaner may just have passed for example.

In many respects it should be sufficient simply to point out that the reductive argument is fallacious and is consequently of minor interest as Aristotle recognized many years ago. However, assuming the reductive schemata as axiomatic, contemporary reductivists have developed all kinds of nonsense to give not only logical support to induction but also to substantiate claims like the reductive method is the dialectical counterpart of the deductive method (Professor Geaorg Klaus (2)) or that the so-called hypothetico-deductive method is a particular branch of reduction namely, progressive regressive reduction (Professor I.M. Bocheński (3)). The Austrian philosopher Professor W. Leinfellner, for example, asserts in his book *Einführung in die Erkenntnis und Wissenschaftstheorie*,

"Above all the reductive scheme is epistemologically interesting because it...tries to build a rational analogue between induction and deduction, a method which would yield

constructive (logical) instructions and formulae..." (4).

There would appear to be such a preoccupation by some philosophers of science to attempt to justify the principle of induction that they seem perfectly willing to accept any philosophical humbug to justify its continued practice.

In their writings many reductivists cite the works of Professor Jan Łukasiewicz in which it is assumed that the classic statement of the reductive method is to be found. Professor I.M. Bocheński in his book *Die zeitgenössischen Denkmethode*, for example, writes,

"The distinction between laws and rules is not only of great theoretical importance but it also allows, as Łukasiewicz has shown, all methods of forming conclusions to be divided into two broad classes, namely deduction and reduction." or, "Łukasiewicz shows that so-called induction is a special case of reduction" (5).

The particular work of Łukasiewicz that reductivists cite is his '*J o Indukcji jako Inwesji Dedukcji*'. However, it can be seen quite clearly in this paper that Łukasiewicz did not propose a reductive method (it seems that in its modern form it was first proposed by Sigwart) and that Łukasiewicz fully recognized the fallacious nature of the reductive argument when he notes,

"...inductional conclusions may not be derived in this manner (using reduction) because applying inversion we obtain a syllogism, not induction, and this leads to erroneous conclusions of the second and third syllogistic figure...induction is not (therefore) the inversion of deduction" (6).

Bocheński's book *Die zeitgenössischen Denkmethode* contains one of the best statements of the reductive method. In this book he seems to consider that induction can be legitimized by way of

the following example (7),

If all pieces of phosphorus ignite below 60 C,  
then pieces a,b and c will ignite below 60 C

Pieces a, b and c do ignite below 60 C

Therefore all pieces of phosphorus ignite below 60 C

noting that the example, "...is quite clearly a reduction, since we have inferred the antecedent from the conditional statement and its consequent. Such inductions are used in every science, and they are in fact more frequent than any other process..."(8). But even in the disguise of the reductive schemata there is no logical reason to assume that 'all pieces of phosphorus ignite below 60 C on the basis that 'pieces a, b and c' do. This has not solved the problem of induction, on the contrary, it seems to add more confusion. And the situation becomes more confusing later on in the book when not only does Bocheński attempt again to legitimize induction but he also considers that the reductive method is implicit in the so-called hypothetico-deductive method. His argument rests upon two distinct types of reduction, that is, progressive and regressive reduction,

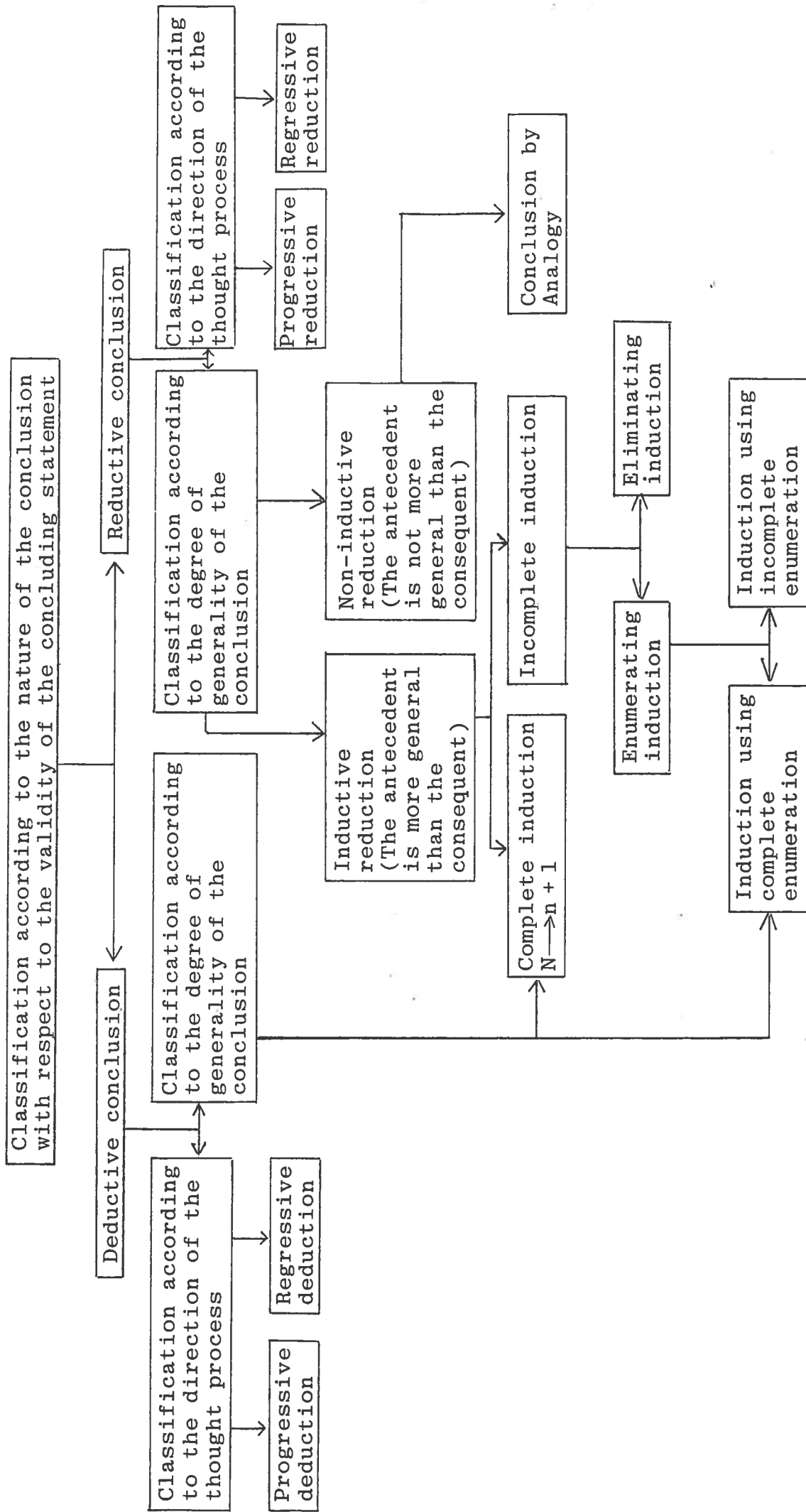
"If the reduction is to be done progressively...the antecedent - whose truth-value is still unknown - is taken as the starting point, from which the argument proceeds to the known or ascertainable consequent. This progressive reduction is called 'verification'", whereas regressive reduction, "...begins with the known consequent and proceeds to the unknown antecedent"(9). This then leads Bochenski to assert that,

"It is obvious that the common expression 'hypothetico-deduction' refers exactly to the two directions of the reductive method: it is hypothetical, that is explanatory hypotheses are formulated using regressive reduction, and it is deductive as

verifiable consequences can be derived from these hypotheses using progressive reduction"(10).

As 'obvious' as this may appear to Bocheński, I believe that Bochenski is simply confusing the issue. That is, hypothetico-deduction is simply what the words assert, namely, hypothesis formulation, a psychological act for which we can give no rational explanation, and the deductions from the hypothesis, and no more.

A measure of the extent to which some persons will go to attempt to justify the principle of induction can be seen from the elaborate diagram overleaf due to Professor Rudolf Goebel (11).



Overview of the Reductive Method of Reasoning



The reductivist position may become more understandable in the light of what Bartley has called limited rationality. That is, reductivists seem to have called "...a halt to rational justification...", and reductivists, as a fidiests, have, "...deliberately (made) a final, unquestionable subjective commitment to some...particular principle...or set of presuppositions" (12). That is, the only explanation to account for the acceptance of a reductive method seems to be an 'act of faith' in a logical fallacy. Bertrand Russell's act of faith in the principle of induction is understandable when he writes,

"...induction is an independent logical principle, incapable of being inferred either from experience or from other logical principles, and that without this principle science is impossible" (13)(Bertrand Russell, History of Western Philosophy, p 700).

That is, Russell makes an act of faith for which he gives no reason. However, the reductivists' act of faith is hard to accept when it is founded upon such an obvious and blatant fallacy.

The act of faith we are supposed to make in order to legitimize the reductive method has been summed up well by Professor Wolfgang Segeth in his book Elementare Logik in which he writes,

"Idealist philosophers are always doubting the reliability of the reductive method in general, and the inductive method specifically...they (the Idealists) demand a justification for the reductive method. Such a justification (my emphasis) comes from practical human transactions. Reductive statements have proven themselves time and time in society, in the sciences and in everyday life..." (14).

Here Segeth is trying to justify his reductive and inductive methods by the method of induction, i.e., the induction in 'reductive statements have proven themselves time and time again'. The use of induction in this example simply leads to circular arguments long recognized by, what he terms, 'Idealist' philosophers. This position is similar to that of Bocheński's when he notes,

"...the rule employed in reduction may (my emphasis) seem questionable...yet (it) is very often used, in everyday life as well as more especially in the sciences" (15).

And although Bocheński admits that,

"Reduction poses very difficult problems, which have not finally been solved..." (16),

Bocheński devotes a thirty-five page chapter to the reductive method and its implications.

By way of summary I would like to suggest that although reductivists base their method upon a complete fallacy, on the basis of this they appear to be attempting to find some unity of method. That is, they seem unable to give up their irrational belief in the principle of induction, consequently they are led to the fideist position of limited rationality in which they subjectively accept a logical fallacy as the axiomatic base of their programme. They seem to be quite optimistic in this programme, for as Professor Georg Klaus points out,

"...unlike deduction...the systematic analysis of the reductive method is still in its early stages" (17).

And in their optimism they may argue something like 'if you only admit the reductive method, all else follows'. But as Bartley correctly points out in his *Retreat to Commitment*, "...it may be difficult...to argue with any such person (a reductivist, for

example) for he will have abandoned argument" (18) as persons like Bocheński, Klaus, Segeth, Goebel and Leinfellner seem to have done on this matter.