



## On Scientometrics

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### Abstract

*A thesis is presented here according to which a quantitative measurement of research output may not be feasible in consistent terms.*

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### Introduction: supposing that science's future progress be rationally predictable

If research activities' output were measurable in quantitative fashion from within the system where such activities take place, then innovation scholars belonging to this system might devise deterministic/probabilistic theories of scientific progress (which would be stated in mathematical/statistical terms) and, once these general conjectures had tentatively been tested, the same scholars may derive from those theories (more or less exact) rational predictions on the future growth of scientific knowledge..

### Apparent rejection by K.R. Popper of Hypothesis [1]

But we have been knowing for sure that according to a proof given by Popper in 1982 (Idem, Postscript to the Logic of Scientific Discovery) it is impossible to make such a prediction.

### A naïve, futile attempt

Someone may perhaps attempt at rejecting the Proof by referring to the much mooted, and very often denied, Popper's criterion of demarcation of science; but, such by a would-be epistemologist <<critique>> has no relevance, since, by paying due attention to the Proof's content we easily understand that no theories' <<falsification>> is referred at in it: rather, in the Proof, the conditions are discussed for theories' <<acceptance>>.

(The twenty-so pages where the great Philosopher discusses his Proof are possibly among the most important he ever wrote and they deserve to be studied with the most careful examination.)

### An inescapable conclusion?

The Proof is essentially tautological: therefore, whenever we accepted the assumptions it is based upon, we had also to accept its conclusion. And the crucial assumption made by Popper is that the

prediction of the future growth of rational knowledge is made from within the system such prediction concerns.

So, in order to reject Popper's proof one could attempt to say that the scientific cadre does not form a system. But such a statement would appear really difficult to be made, considering the extremely close, rational connections linking scientists through their thorough reciprocal scrutiny, which underlies the whole process of scientific communication (reviewees for publications, citations, conferences etc.).

### A possible relevant consequence

A basic theorem of formal logic states that:

$$[(A \rightarrow B) \rightarrow (\sim B \rightarrow \sim A)]$$

namely:

[if (if A then B) then (if non B then non A)] whereby:

{if [if (the possibility of measuring the research output quantitatively) entails (the possibility of predicting the increase in scientific knowledge rationally)]

then [(the im - possibility of predicting the increase in scientific knowledge rationally) entails (the im - possibility of measuring the research output quantitatively)]}.

### Conclusion: A last escape route

The last line of defense of whom wants to deny the relevance of Popper's Proof consists in saying that that demonstration concerns the qualitative, not quantitative, increase in scientific knowledge. But, in fact, that this qualitative content of scientific knowledge will somewhat be boiled down to a quantity is the fundamental idea on which quantitative measurement rests.

### References

1. Popper K.R., THE OPEN UNIVERSE. An Argument for Indeterminism; (From the: POSTSCRIPT TO THE LOGIC OF SCIENTIFIC DISCOVERY); Routledge, London, 1982: pp.62 – 76.

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