



## SCIENCE ASSESSMENT: WHAT IS LIMITATION MEASURED?

**Sergii Boltivets**

*State Institute of Family and Youth Policy of Ukraine, Ukraine*

### Abstract

*The article launches a discussion regarding the evaluation of scientific activity or the evaluation of journals in the light of databases, and mainly with reference to the Leiden Manifesto. The foreseeable consequences of the totalitarian imposition of scientometric approaches leading to segregation in the scientific field and, as a consequence, its destruction, as happened with the science of the USSR, are given. Scientometry or bibliometry, which has recently been regarded as the apex achievement of the human mind, is represented as cytatometry or, more accurately, surname (special metometry). It is substantiated why such an approach has the opposite effect: a quantitative indicator obscures the absence of what is the essence of science. The question is, to what extent is the review of literary sources of scientific importance beyond performing the ethical ritual of honoring predecessors? What will change the scientific results if the respect for glorious ancestors is otherwise exercised? The article describes the definition of science as a sphere of human activity in a broader sense than it tries to impart to policy science (science as a force in new weapons), publishers (science as a factor of influence), or entrepreneurs (science as a new income). Science is presented as the embodiment of the cognitive needs and capabilities of all mankind, which is always an individual acquisition of the individual, including in the case of combining individual efforts in any of the groups of people united for a common purpose. The part of the population involved in the predominantly knowledge-intensive mode of production and maintenance of human viability will naturally grow. Within the bounds of lawlessness outlined in the title of the article, attention is drawn to the question of who is crossing the boundary between the known and the unknown. The overcoming person makes this sense of their own activity, which is commonly called scientific. But overcoming this boundary does not necessarily translate into the propaganda of what has come to light - the design of text that has been defined as scientific. Therefore, the review of the absurdities seen and recorded by Jonathan Swift in the 18th century is proposed to continue counting the names of 21st-century scholars called scientometry or bibliometry, which has nothing to do with evaluating science as a process and the consequence of bridging the line between knowledge and ignorance. Large-scale attempts to reduce all scientific knowledge to numbers gave rise to the conclusion in the article that mathematical calculations as a way of assessing science can be very accurate in detail, but wrong in general. It is argued that the assessment of science is the same science that can exist only in the form of research. The assessment of the value of science results to society belongs to all members of society, not just to members of a limited circle of scientists who, for the most part, happen to be the evaluators.*

**Keyword:** *definitions of science, scientometry or bibliometry, surname (special feature), Leiden principles, English segment, limited number of scientists, avoidance of one-sidedness, science for society.*

### Introduction

In totalitarian states and in hierarchical professional communities, there is a natural struggle for the safest place under the sun, which is a place that requires the role of leader, Fuhrer, leader, duke, king, pharaoh, chief, boss, leader or at least close to his throne, received not so much by grace from above, but by the measured amount of merit from

below. In other words, it is the base that plays the role of a podium, on which the careerist is best seen from above by a leader, a Fuhrer, a leader, a duke, a king, a Pharaoh, a chief, a boss, a leader. Under favorable circumstances, these individuals have the greatest chance of such a podium to come up and take the leading position - the throne. Scientific work, not embodied in anything tangible, visible or at least understandable, creates a vacuum of appreciation, capable of being filled by any numbers that can be perceived as plausible. As it is easy to see, the scientific community of many, if not most, of the world does not neglect any measuring instruments to measure the imperial choirs from the rest of the scientific department's counterparts, by comparing this to humiliating and even destroying their efforts. The emperors of science are fighting for money, which brings with it digital glory as proof of funding. In this case, the total funding of science in the world is decreasing - it is profitable to finance not all but a select few, as it was systematically brought to perfection by the communists of the former USSR, by demolishing it thereby.

As a scientist whose scientific career began in the scientific field of the former USSR, the consequences of totalitarian planting of scientometric approaches leading to segregation in the scientific field and, as a consequence, its destruction, as happened with the science of the USSR, are foreseeable to me. Perhaps the readers of these lines in defense of the scientometric ordering of the scientific world will cite here the arguments of the scientific flourishing of the Third Reich, unknown to me? If mathematical measurements alone determined scientific progress, the Holy Inquisition would have completed it much sooner.

### **Leiden Principles**

Cautions about the uselessness of bibliometry, reflected in the ten principles of the Leiden manifesto, have been cautiously expressed in recent years by many scholars, including Reinhard Werner (2015), Diana Hicks, Paul Wouters, Ludo Waltman, Sarah de Rijcke & Ismael Rafols (2015). This problem is also thoroughly considered in the measurement of the reflection of science in modern technological education (Lamanauskas, 2017). In general, the Leiden Manifesto is perhaps the first very cautious attempt to reconcile quantity with quality, and therefore to offer its own perpetuum mobile variant. The Ten Principles of this Manifesto clearly claim to be the Ten Commandments of the Law of God in the field of science, which are presented in the table of our doubts (Table 1).



**Table 1. Leiden principles and our discussions.**

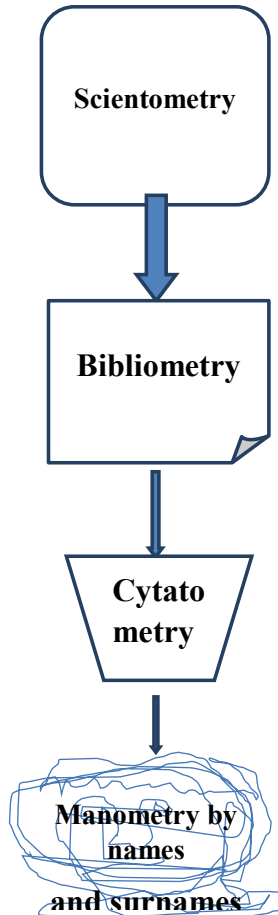
No.	Ten principles	Ten discussions
1.	Quantitative evaluation should support qualitative, expert assessment	Who discovered the quality of scientific discovery? How is a quality expert different from a scientist? Quality is impossible without quantity?
2.	Measure performance against the research missions of the institution, group or researcher	Do you have to go to one river twice? There are so many scientists on the planet that any of the others can measure the results of one (one)? Wilhelm Conrad Röntgen poorly repeated the results of Ivan Pulyuy and made them worse - is this the way to progress?
3.	Protect excellence in locally relevant research	Is the defense of excellence a defense of the science of English Naziism? The lack of equality of all languages on the planet has a scientific solution? What is it?
4.	Keep data collection and analytical processes open, transparent and simple	If simplicity is integrity, are the simplest microorganisms on our planet the ideals of virtue for scientists?
5.	Allow those evaluated to verify data and analysis	If scientific research data can be verified by a third-party audit, is it not easier to abandon scientists and immediately call on auditors to audit auditors?
6.	Account for variation by field in publication and citation practices	Isn't this a confirmation that digital variations can be very accurate in detail and incorrect in general?
7.	Base assessment of individual researchers on a qualitative judgement of their portfolio	Can anyone explain what the value of a researcher's lifetime achievement is to a science assessment?
8.	Avoid misplaced concreteness and false precision	Is not this principle a contradiction of all others related to quantitative estimates?
9.	Recognize the systemic effects of assessment and indicators	Do not these systemic effects deny the essence of science?
10.	Scrutinize indicators regularly and update them	Isn't updating your metrics as useless?

At first glance, it may seem that our discussion questions diminish the meaning of the principles of the Leiden Manifesto, but in reality it is not. On the contrary, the above principles confirm the methodological futility of measurements in kilograms, centimeters, citations, names, pages and letters, unless such measurements are actually intended to be financed by the customer, which coincides with the authors' wish.

### Science Evaluation Concept

In fact, if science is a phenomenon consisting of homogeneous objects or at least objects that can be classified by a certain homogeneous feature, then is it science? Scientometry or bibliometry, which has recently been regarded as the apex achievement of the human mind, is in fact cytometry, or more accurately called surname (special feature).

The number of mentions of the surname per square kilometer in its content is no different from the calculation of the number of letters, punctuation and volumes of text. In Figure 1 we list these values.



**Figure 1. The values of scientometry, bibliometry, cytometry and surnamemetry (facemetry).**

As can be seen from Figure 1, the whole matter of scientometry or bibliometry is reduced to mentioning the authors' names and completing them. There are no quality categories in which scientometrists (bibliometrists) might be referring. Moreover, this approach has the opposite effect: the quantitative indicator obscures the absence of what is the essence of science, that is, the deception of a credible financier of scientific production. Yes, scientometry is a caricature of financial values that financiers of science can imagine - bigger scientometric numbers are the price of bigger money. We are far from thinking about evaluating this approach in terms of fraud, misuse of trust, fraud, fraud, because no one is



hiding ways to get completely vain figures. Just the same reflects the similar - the ability to turn anything into financing.

The first question that scientists, as well as clients of scientific research, do not dare to ask is, to what extent is the review of literary sources of scientific importance beyond performing the ethical ritual of honoring predecessors? What will change the scientific results if the worship of glorious ancestors is otherwise carried out? Is science something that has already become common knowledge? In order to address the issues raised, we consider it necessary to finally choose one of the many definitions of science that would be most relevant to its mission in civilizational development. We provide our definition in the form of Figure 2.

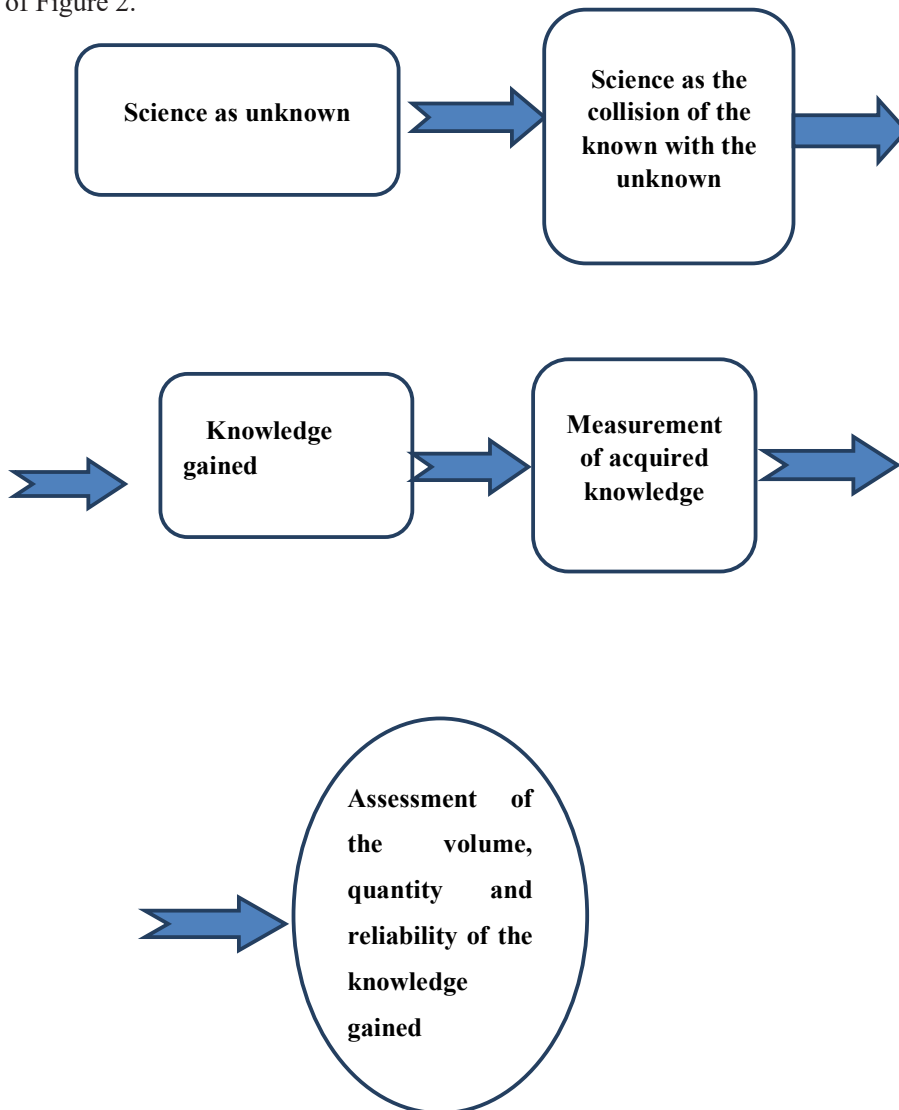


Figure 2. Defining science as the process of transforming the unknown for the known (knowledge).

As can be seen from Figure 2, scientometry or bibliometry, in the form in which it is fairly evaluated by the Leiden manifesto, cannot be considered in any of the phases of transformation of scientific knowledge from its extraction from the unknown to the evaluation of the volume, quantity and reliability of the obtained. After all, it is about the knowledge gained, not the calculation of the number of persons who performed this work. If such a measurement is true, then why does not any person measure any work. For example, why is the digging of the foundation pit laid by the volume of excavated soil and not by the names of the workers? The taste of the food in the restaurant in this case should be judged by the chefs of another restaurant, not the paying customers.

Attempting to base their assessment on any sphere of human activity and on their results is an indicator of the ability to self-preserve for both human and human groups and human societies as a whole. The criterion of self-preservation, and therefore of acceptability in all cases, is known here. In the field of science as the sphere of the transformation of the unknown into the known, any estimate other than the estimation of the creator of that transformation will be an inaccurate, inappropriate concept, which is always a stage of its much larger, unknown at the beginning of the measurements, and therefore erroneous by definition.

It seems strange, futile, and therefore unnecessary, to design medieval scientific treatises, a form that consumed more of their creators' efforts than their content. Scientific publications in journals will look no less strange in the near future, but their main value in scientific-metric (bibliographic) bases, which are also divided into less and more prestigious ones, is of great value today. It will be legitimate that scientific discoveries will increasingly be presented to the world outside of bibliometry in cases where the content of the previously unknown will find itself necessary for its holistic expression of form. In all other cases, the form will determine the content, and therefore the search for scientific novelty based on bibliometric data will become increasingly meaningless. Prestige will disappear because it has no property to be archived.

In any case, we consider it necessary to return to the definition of science as a sphere of human activity in a broader sense than trying to give it to the science of politics (science as a force of new weapons), publishers of commerce (science as a factor of influence) or entrepreneurs (science as new earnings).

First of all, science is the embodiment of the cognitive needs and capabilities of all mankind. However, science is always an individual asset of the individual, including the combination of individual efforts in any of the groups of people united by a common purpose. The part of the population involved in the predominantly knowledge-intensive mode of production and maintenance of human viability will naturally grow. In this context, the question naturally arises: what is the significance of quoting one billion of the Earth's population for another billion who have recognized them as the first existence? Is it really an axiom that quoting authors' names is anything more than quoting authors' names for the development of scientific knowledge? That is, a shaman who cites spells of his kind, exclaiming them, performs the same productive action as a researcher who rewrites the most important thoughts of his colleagues, suggesting and spreading their influence? In paying tribute to the distinction between the known and the unknown, is this the main purpose of scientific work?



In our view, the citation ritual should be excluded from the scientific field, since it has nothing to do with figuring out what is not there yet. The repetition of what is already in persons, as we see, remains a ritual repetition, not a representation of what has not been.

We leave the answers to these and related questions open to the prospects of the cognitive development of the individual uniqueness of each of the more than seven billion people on our planet who live and develop on it at the same time. In doing so, we draw attention to the individuation of the knowledge we have acquired and that which will still be gained. The essence of individualization is best presented in Table 2.

**Table 4. Individualization of science as its origin on individual human request.**

Cognitive inquiry	Differentiation needs
Knowledge of the environment and yourself in it	Introjection of man in distinguishing himself and the environment: fauna, flora and organic world
Knowledge of environmental opportunities for yourself and your own	Self-realization of the person: search, testing and realization of the possibilities
Knowledge of individuality of self	Self-affirmation among people: differentiation of oneself by means unknown to others

As can be seen from the contents of Table 2, the answer to the question on which the main question is answered by science is its exclusive individualization in response to the increasingly individualized cognitive inquiries of man. Mass recognition, which is the mass citation or mention of the surname of the person posing as a scientist, therefore loses all meaning. The epoch of totalitarianism, a characteristic feature of which has been the widespread citation of Hitler, Mao Zedong, Lenin, Stalin, Gorbachev, who now lives in the United States, we hope that joint efforts must first of all be left behind in the past.

In the framework of the lawlessness outlined in the name of our reflection, we must draw attention to the question of who is crossing the border between the known and the unknown? The overcoming person makes this sense of their own activity, which is commonly called scientific. But overcoming this boundary does not necessarily translate into the propaganda of what has come to light - the design of text that has been defined as scientific. Text is an image, and therefore, by definition, scientific are by definition referred to by other images - diagrams, drawings, photographs and more. In this case, how does science design the volume? How, in addition to images that include descriptions, does it convey, for example, the smells, tastes, touches and visceral sensations of living things to which a human being belongs? And how, without images and textual descriptions, can life sciences be able to recreate life in full size and dimension? And in this case, what place belongs to the number of quotations and mentions of different names? The inability that still proves the inability of those who consider themselves scientists to evaluate themselves and the results produced by them has earned Jonathan Swift's unrivaled rating in Travels into

Several Remote Nations of the World, in Four Parts. By Lemuel Gulliver, First a Surgeon, and then a Captain of several Ships)»



**Gulliver's Journey to Laputa. Academy and Lagado.**

**Figure 3. Grandville artist (Jean Ignace Isidore Gérard)**

Lagado Academics – scientists of the Grand Academy who invent new methods of agriculture and architecture and new tools and tools for every kind of crafts and production that they assure - one person will do ten jobs; within a week it will be possible to build a palace of such durable material that it will stand forever without requiring any repair; all the fruits of the earth will ripen at all times at the request of the consumers. According to Gulliver, none of these grand projects has been completed: the country is in ruins and the population is starving and going to rags. One of Lagado's academics has been developing a solar-powered cucumber project for eight years and then using it to heat the air in the cold





and rainy summer. Another "resourceful architect" came up with a new way of building homes, starting with the roof and ending with the foundation. On top of insanity is a project to transform human excrement into those nutrients from which they are formed. The activities of academics in philosophy, politics, poetry, mathematics, the reports of which have been published in the writings of the British Royal Scientific Society, appear absurd and improbable. A review of these nonsense, seen and recorded by Jonathan Swift in the 18th century, is quite appropriate to continue counting the names of 21st-century scientists called scientometry or bibliometry, which has nothing to do with evaluating science as a process and the consequence of bridging the line between knowledge and ignorance.

## Conclusions and Recommendations

The first and most important, in our opinion, is the conclusion that the assessment of science in its primitive form as the figure of the surnames of scientists and their quotations does not belong to the sphere of science as the sphere of contact of the known with the unknown. The large-scale attempt to reduce all scientific knowledge to numbers gives reason to conclude that mathematical calculations as a way of evaluating science can be very accurate in detail, but incorrect in general.

Since the numbers are only given the names and quotations of living scientists, and the scientists who are lucky enough to avoid calculations are in another world, it is impossible to establish the true value of the science of amateurs to count the names and quotations in general, because in the present form, the present English-speaking Countries assess science is dependent, science divides the names of the scientists cited in the "kingdom of the living" and "kingdom of the dead." The deceased scientists after the transition to the otherworld leave the bibliometric race and gradually cease to exist in the focus of attention of such assessment. Therefore, it is fair to call such an estimate the calculation of the living in science, as well as the process of dimming the light of influence of those who were in it until recently. We encourage you to check this statement for fans of the number of names and citations - their number decreases in all cases, as soon as a person stops delivering his name to the science metric pride fair.

Is this relevant to the evaluation of science? Undoubtedly, no.

The second most important conclusion is the evaluation of the value of the so-called scientific-metric or bibliometric bases for the evaluation of science. It is about calculating the names and quotations of still living scientists in a certain order or by a certain selection of the creators of such bases. Keeping in mind the whims and local perceptions of their creators, the common criteria are:

1. Counting the living.
2. Narrowness of the subject of calculation only by periodicals.
3. Interest in belonging to the base that conducts the number.
4. Indifference to the content created by scientists.
5. Ignoring any other means of presenting a scientific result than text created by the scientist or group of scientists, where the unit of account is only a surname.

A third important conclusion from our point of view is the danger of such an assessment of science in three dimensions:

1. Restriction of the assessment by the narrowest circle of persons holding positions or financial interest in the scientific field, as a rule, by persons receiving salaries at universities or scientific institutions interested in maintaining and increasing them.
2. Absence of any opportunity to participate in the evaluation of science to any other person, not belonging to the number of persons who publish their texts in periodicals, included in scientific metric (bibliometric) bases.
3. The emergence of false motivation of scientists who become proficient in the English-speaking segment of the scientific field, whose assessment falls in dependence on the number of mentions of the surname of others as dependent on the quantitative criterion as a tennis player, who is just as quoting others as the athlete reflects the ball " I am you - you are me ”.

We recommend the most complex ways of evaluating science, because simple ways will always simplify our attitude to complex things and prevent the subject of evaluation from avoiding one-sidedness. We do not deny the right to exist of a building consisting of only one wall, but we very much doubt its usefulness as a dwelling of a person, except for the use as decoration. That is why we argue that the assessment of science is the same science that can exist only in the form of research. The assessment of the value of science results to society belongs to all members of society, not just to members of a limited circle of scientists who, for the most part, happen to be the evaluators.

## References

- Werner, R. (2015). The focus on bibliometrics makes papers less useful. *Nature*, 517(7534). Retrieved from <https://www.nature.com/news/the-focus-on-bibliometrics-makes-papers-less-useful-1.16706>.
- Hicks, D., Wouters, P., Waltman, L., de Rijcke, S., & Rafols, I. (2015). Bibliometrics: The Leiden Manifesto for research metrics. *Nature*, 520(7548). Retrieved <https://www.nature.com/news/bibliometrics-the-leiden-manifesto-for-research-metrics-1.17351>.
- Lamanauskas, V. (2017). *Reflections on education*. Šiauliai: Scientia Socialis Press.
- Swift, D. (1726). *Travels into Several Remote Nations of the World, in Four Parts. By Lemuel Gulliver, First a Surgeon, and then a Captain of several Ships*. Retrieved from [http://www.gasl.org/refbib/Swift\\_Gullivers\\_Travels.pdf](http://www.gasl.org/refbib/Swift_Gullivers_Travels.pdf).
- Grandville (1856 ). *Gulliver discovers Laputa, the flying island (illustration by J. J. Grandville)*. Retrieved from [https://en.wikipedia.org/wiki/Laputa#/media/File:Laputa\\_-\\_Grandville.jpg](https://en.wikipedia.org/wiki/Laputa#/media/File:Laputa_-_Grandville.jpg).

*Received 11 November 2019; accepted 05 December 2019*



**Sergii Boltivets**

PhD., Professor, State Institute of Family and Youth Policy of Ukraine, Kiev, Ukraine.

E-mail: [boltivetssergij@i.ua](mailto:boltivetssergij@i.ua)

Website: <https://publons.com/researcher/1611226/sergii-boltivets/>

ORCID ID: 0000-0003-4432-5272