

A new approach to the climate issue

M. Carlsson, O. Andrén

Keywords: climate data, cross-disciplinary science, natural archives, provenance

What is an archive? Drawing inspiration from game theory and decision theory, we will here submit this concept to an informal logical analysis. The motive for this study is the use of the composite concept of 'natural archives' within environmental science. We believe that new approaches are necessary in the still chaotic climate issue.

We define an archive as follows:

1. An archive is a set of documents.
2. Every document has a date.
3. Every document contains information and may belong to one or more categories.

Our intention is now that climate data can be viewed in terms of this definition of archives. An analysis of the growth rings of a thousand year old tree is thus an archive with unique information for each year. Environmental science has also studied and collected data from drill cores in glaciers. Furthermore, there is historical data on consumption of coal, gas and oil, which constitutes one or more archives. Finally, there are contemporary measurements of temperature and greenhouse gases.

Perhaps the chaotic situation in today's climate research can be compared with the chaos that may arise in a real archive, e.g. on an authority, if the provenance of the documents is not respected.

The novelty of our approach is thus first that we recognize that 'archive' from the beginning is a humanistic concept. An archive has in this context been mentioned as an organic unity. It has been pointed out that documents give evidence of the archive founders operations. It has been said that the difference between an archive and an a posteriori gathered portfolio of documents based on some historical interest, is of great source critical importance. To respect the provenance means to respect the origin of the documents. As an example of disorder in real archives, it has been pointed out that the French archives were subjected to devastating clear-outs and reorganizations after the revolution. From our time, it can be observed that older people recall how the concept of source criticism began to be used, and recall the situation that existed when the concept arose.

As stated above, our approach includes also an informal logical analysis. The concepts of 'composite archive' and 'provenance' can be defined as follows:

4. A composite archive is a set of archives.
5. To respect the provenance means to not remove and re-categorize documents.

We note that the term 'natural archive' is widely used in environmental science. We believe that the mess that we think characterizes the climate issue can be compared with the mess that sometimes can occur in a real archive.

Our informal logical analysis is loosely inspired from the disciplines of game theory and decision theory. We propose the term 'archive theory' for our analysis.

It would be wrong not to mention the natural archive that we ourselves know so to speak from within. Linked to a research institution, we have to varying degrees investigated soil carbon and soil biological turnover.

Our approach does not require a detailed logical exposition of the archive concept, nor a detailed humanistic study of archival history. It is to combine these elements with observation of the focus of environmental science on climate data from natural archives that we believe is fruitful.

To refine these elements separately think is probably not fruitful. We strive rather for a fusion of these three elements.

A distinction can be made between living archives and closed archives. The concept of 'living archive' can be defined as follows:

6. A living archive is an archive subjected to on-going update.

The following observation can be made regarding the natural archives mentioned above:

7. Climate data comes from living archives.

Being a short introduction, the brief outline of our approach is hereby nearly finished. As concluding remark, we address the question of practical significance.

Can our approach to the climate issue produce any new applications? In response to this question, we want to draw attention to the potential of natural archives to serve as occupational assignment for unemployed people. As a comparison, archival work functioned as reserve work for unemployed people during the middle of the 20th century.

Appendix

Below is shown an attempt to formalize sentences 1-7.

1. $A(t) = \{d_1, \dots, d_n\}$
- 2-3. $d = \{t, i, c\}$
4. $D = \{A_1, \dots, A_n\}$
- 5a. $t_2 > t_1 \Rightarrow \text{Should}(A(t_1) \subseteq A(t_2))$
- 5b. $d_a, d_b \in A \Rightarrow \text{Should}(c(d_a) = c(d_b))$
6. $\text{closed } A(t_1) \Leftrightarrow_{\text{def}} \forall t (t > t_1 \Rightarrow A(t) = A(t_1))$
7. $A \in C \Rightarrow \neg \exists t_1 \forall t (t > t_1 \Rightarrow A(t) = A(t_1))$