# CCBIO Opinion

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# South African Diamond Miners One Hundred Years Ago and Laboratory Researchers (or Biologists) Today

At the end of the nineteenth century, the young English businessman Cecil Rhodes hired thousands of South African youths to dig diamond mines. These very hard-working young Africans dug a "deluge of diamonds". In just a few decades, Cecil Rhodes became one of the richest men in the world, England became one of the richest countries in the West, and the West became the richest part of the world.

South Africans continued to dig diamonds without understanding the real meaning of their work and without grasping the laws of finance and the power mechanisms of Western countries. For this reason, all these young diamond diggers died poor and worn-out.

I find similarities between these diamond diggers and today's young laboratory researchers, "digging" a "deluge of data" in the fields of genomics, proteomics, metabolomics, etc., but for what purpose? "They're fundamental for medical science" someone might say, just as young South Africans used to say: "Diamonds are fundamental for English people". But what is this science?

The South African diggers failed to shift from the linear concept of "digging for money" to the general idea of the system of finance. Laboratory biologists are still struggling to shift from the concept of linear causation ("the billiard ball model") toward a systemic view of biological processes.

The complexity of biological processes is pushing scientists to rethink the concept of causation, primarily by considering not only the components of the systems but also their relationship and their evolution over time. This explains, for example, the methodological and epistemic relevance of the microenvironment. However, rethinking the concept of causation does not exclude the possibility of reformulating the original question that pushes researchers to "dig" for specific data.

In this "search for a meaning", philosophers are leading the scientific community to re-integrate epistemological and theoretical questions into the technological advancement of research. Without a meaning, diamonds were only stones under the soil for the South African diggers. Without a meaning, data are lists of insignificant information and their extraction a meaningless "mechanical' task in the daily life for researchers.

Rhodes was neither rich nor a genius at the beginning of his carrier. He was simply a young, sick boy sent to breathe clean, fresh air in South Africa. His only quality was the ability to observe and make connections. This story can be an example of how science can advance even without a huge budget.

By analogy with the experience of the South African diamond diggers, we can ask these questions about our own work as laboratory scientists: How do we integrate ourselves with our work? How should young scientists be educated? What skills do we really need? What is the system we are working for … and to what end? ••

Sometimes it looks like we laboratory researchers in such fields as genomics, proteomics, and metabolomics are working to sustain academical and pharmaceutical systems, forgetting that we are working to heal people. ••

Mitchel SD (2009) Unsimple Truths, Science, Complexity and Policy. The University of Chicago Press.

Bertolaso M (2016) Philosophy of Cancer – A Dynamic and Relational View. Springer Series in "History, Philosophy and Theory of the Life Sciences"