

1999-12-06
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Comments on scientific activities in information science

BACKGROUND

This is not the place to contribute to the many solid theories that over the years have been put forward concerning the nature and art of general scientific thinking. Instead, the author here wants to contribute with a number of scientifically practical observations. These are building on the author's own experience. It may be allowed, however, to refer also to comments seen from a complementary angle. The author refers to remembrances from early parts of life. The author had the good fortune to be brought up in a "scientific family" with a father, Bertil Ohlin, who was an exceptionally established and renowned economist, and who brought many leading scientists to visits at the dinner table. It so happens that the present time is the 100 year anniversary of his birth, a fact that may allow for this connection. Some of the thoughts below have their origin from the many contacts and discussions with him that took place over the years.

Our two backgrounds naturally have been different. But there also are resemblances. At the time when my father found himself active with, as it later turned out, some of his most longterm scientific contributions, economic science was still young. In the field of theory for international trade, the logistics at the time was only slightly touched on. This must have been felt as a challenge for him.

On the same note, information science to the author's opinion during the later decades of the twentieth century finds itself in a theory developing situation. The general logistics for value added information services is waiting for a chance to be formulated. This is a challenge today.

Perhaps this is always the case, over time. For the scientist, there exists a logical vacuum, an empty system area that hungrily waits to be filled with meaning and content. Sometimes this space of vacuum is well defined, with clear limits, mostly it is not. Often, an early scientific challenge concerns the desire to define a language to sharpen the borders around the space mentioned.

Below, a number of comments on scientific thinking are mentioned. Although the aim is towards information science, many of them are general - since there are few sharp borders between different sciences.

FREEDOM OF THOUGHT

An open environment

The most fundamental environment for creative thinking in information science, as in all sciences, is an environment of freedom. This freedom must be limitless in all dimensions.

Grab the moment!

Creative thoughts often appear at very unconventional moments in time. In a subway, on a bus, at night just before falling asleep etc.

Should such thoughts be registered somehow on the spot? Many scientists have recommended to have a notebook available any time of day, instantly. Some people prefer a tape recorder, or a hand (palm) computer nowadays. Certain scientists refer to the appearance of creative thoughts while asleep, you wake up in the middle of the night, convinced that you have an exceptionally creative thought in mind, and simply have to record it immediately, somehow. But others feel that the creative moment belongs in a group of rather conventional moments.

What are the characteristics of the creative moment? Are there any, at all? Some people refer to the sudden appearance of a "What if?" feeling. Is this related to time? Then, for instance, what type of achievements are dependant on resources that are time proportional?

Relaxation - lack of concern for the present moment

Should we be observant of the fact that we at the very research moment are active trying to create new knowledge? The concern for the moment (looking at the watch often) may have limiting and bordering effects, we feel that there are obligations and time related restrictions that we must obey, which may be looked on as a disturbance, a disadvantage. On the other hand this may be counteracted by the fact that we may find ourselves more effective, at least for quantitative thinking, at such times. The balance is probably personal.

Resource dependance

It is sometimes noted that certain types of resource poverty supports, or demands, creativity. Do we invite new thoughts by providing scarce resource situations for scientists? Many would propose the contrary, scientific creativity often only by chance emanates from poor environments.

METHOD

Association and comparison

Many creative thoughts have been thought and formulated a long time ago. It is only in their present environment that they are new. Are we always repeating ourselves?

Borders

Comparisons over borders often show to be extremely useful. As a matter of fact, many scientific achievements very likely have been formulated before they were recognized officially.

Logic vs emotion

It is difficult or impossible to suggest priorities between the logical thought and the emotional scientific intuition. Emotion for many play a fundamental role in scientific thinking.

CONTENT

Science dependance

To what extent are achievements in information science dependant on the fact that they concern this very science and not another? We can ask here if information science is well defined. Most scientists in the field would say it is not. But, is there some sense in which information science is different from other sciences?

Are all sciences alike? Does there exist a super-scientific structure? This may well be so.

Culture dependance

Scientific intuition may to some extent be dependant of cultural prerequisites. To the authors' experience this influence is positive for expansive creativity.

Gender borders

To the author's experience, there are few, if any, essential gender borders in information science. However, lack of observation, perhaps understanding, creates a problem. It is unacceptable that there is a gender unbalance in science. There must naturally be as many female university professors as there are male. Very strong measures should be taken to achieve this in short time.

ENVIRONMENT

To be early

To be early is something that the active scientist seldom considers. She or he is a working person, with problem solving in mind, seldom relating to the tactical or time dependant consequences outside of the research room. Such thoughts, if they arrive at all, arrive much later, often when other observers note achievements that later show to be "early".

It is the task of entrepreneurs to follow up, to market, to sell scientific achievements. Many of these do that with surprising success.

Scientific passion

To the author's experience, scientific passion is one of the most relevant attributes in scientific work. It is essential to feel the "creeps" when the untried thought appears.

Diligence - the importance of hard work

Are scientific achievements in information science to some extent proportional to the amount of work spent in the thinking? Many would say yes, however the details are difficult to define. When Isaac Newton was asked about how he could solve these up til then unsolved problems, he answered: "By always thinking about them".

Bureaucracy

Talent for corridor contact shaping increasingly seem to be valuable in big research projects. This is especially so for EU projects, where the need for bureaucratic talent is becoming essential. Is relevant bureaucracy proportional to a project's size?

TOOLS

Search for fact

Computerized tools are essential for any science today. Access to data from previous scientists, as well as from own sources, are fundamental. Libraries today have some of their most relevant forms online.

New methods are being created rapidly concerning increased efficiency in information retrieval. More and more refined types of information retrieval intelligence are introduced.

Increasingly, the Internet is taking over as a primare source for scientific information retrieval. In a rapidly developing science like information science, short texts in report form increasingly are looked for, rather than printed books. It takes time to print and make public a book. This is said to differ between different sciences, though.

Software support

How important are basic scientific methodological tools, like statistical and mathematical software packages? For many scientific achievements, they are fundamental. Even Albert Einstein hired a professor of mathematics, to help with scientific calculations within his "general theory". This may be a relief for most of us.

Personal contact

With e-mail, it is nowadays possible to contact even the most renowned scientist. Whether she or he takes the time to answer fully, is another matter. But the fact is that we today have a means for communication that is extremely helpful, even with strongly "vertical" contacts.

Group contact

E-mail and computerized conferences of different types in two decades have become completely essential for scientific development. Today, it is impossible to contribute scientifically without these means. How did Leonardo da Vinci manage without them? His achievements look even more impressive with this in mind.

The computer as carbon paper

Access to early thinking also creates dependances. It is only too easy to switch to an earlier private observation, adjust it a little, and then present it as "new". Repetition is often necessary, but there is a risk that the scientist becomes the slave of repetition.

It is very likely that a Nobel laureate in one science would have become a fine scientist in another.