Bert Mulder

Versuch einer Geschichte der Rechenmachine

Versuch einer Geschichte der Rechenmachine (Attempt at a History of Calculating Machines) gives an overview of known techniques and machines that make calculating more efficient. Just another historical overview, if it hadn't been published almost two centuries ago, in 1804: *with tables and drawings, in 2 volumes.* The writer, Johann Paul Bisschoff, is *Kriegs- und Domänenrat,* advising the court of Ansbach in Germany in matters of war and the land. It is a precisely written overview over known methods and machines with regard to calculating, ranging from the use of hands to the famous calculating engines like those of Hahn or Pascal.

The work has never been in print before. The manuscript was kept in the technical university of Berlin, and was lost during a fire in the second world war. Left with two undated written copies and photographs of the illustrations, Systhema Verlag in Germany decided to publish it.As a technical report on the state of an
art it is surprisingly modern in setup: an introduction contains definitions of concepts ('what it takes to calculate'), part 1 *Concerning the Simple Tools* carries an historical overview and part 2 *About Calculating-engines with Wheels* has technical descriptions of the engines. The book concludes with the 29 plates, all beautiful technical drawings.

Why would you want to read *Versuch einer Geschichte der Rechenmachine* written in 1804? To the careless reader it might be nothing more than what it was meant to be: an overview. But the book deserves better than that. This publication shows all that is at the basis of information technology and western culture: numbers, methods and mechanisation. It tells us of the intense effort at the heart of western science and its fascination with the addition, multiplication, subtraction or division. What drives us to refine, time and again, our calculations into more and more powerful ones, and then apply them to all we see?

Of all the worlds' cultures, western scientific thinking clothes itself in numbers and mechanisation. Numbers guide the hands and tools with which we create our world and the eyes through which we view it. Today's world, its populations and cultures are supported by a powerful industrial and economic ecology that comes mainly from western-scientific thinking. Bisschoff's *rechenmaschinen* commemorate the beginnings of that.

The Dutch professor Van Praag mentions that in many developments one can recognise five revolutions: methodological, scientific, technical, social and cultural. The book highlights the very beginnings of the technical revolution within the field of 'number-crunching', a development that ends with computers
as we know them. We find the shift from scientific to technical revolution in these very pages. We find the social and cultural revolution on the streets around us. They all have calculating engines at their heart.

Part of:

2

Mediamatic Magazine Vol. 7#1

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Artificial Evolution in an Artificial World

In the 17th century preoccupation with numbering systems, codes and languages was intense. Many people were looking for a 'clavicula universalis', a universal code with the power to describe all that went on in the universe. Swedenborg did his work, Leibniz' binary arithmetic was born and Newton's mathematical descriptions of the physical world formed the basis of classical physics. The human mind was set to capture the universe in symbols. Numbers and method that could formalise the world around us. Method that needed calculation: enormous amounts of complex calculation.

The Scottish mathematician Napier (the name written as 'Neper' by Bisschoff in 1804) published his discovery of logarithms in 1614. Bisschoff writes about him at length, but more as the inventor of a 'tool', a precursor to the slide rule, than of logarithms. His treatment concerns the mechanical tools, and he describes the several enhancements and additions to Napiers tools.

Logarithm itself, based on the relationship between mathematical and geometrical series of numbers, is the enabling technology of 300 years of scientific development. It speeds up calculations by changing multiplication into simple addition and division into subtraction. Without them none of the sciences would have developed. Then in 1970 electronics turned algorithm into silicon. Taking away our direct manipulation of them by making the slide rule obsolete, algorithms disappeared from sight. But before the algorithms turned into digital binary silicon, many other ways to mechanise calculation had been tried.

Bisschoff declares his subject to be calculating engines, and he sticks to it. Mentioning Leibniz's calculating engine (that was never realised, although a sizeable amount of money was put into it) in the 'simple tools' section he says: *the realisation of his idea seems possible to me, but it seems like much work to me for little use and therefore I don't think it worth the trouble to lose more time on it. And then: all trouble so far couldn't improve nor replace Napier's counting sticks by better tools. Everything that was done to make them better or simpler to use concerned only the form, and not the essence.*

Bisschoff defines calculating engines in the introduction:

"The expression 'calculating machine' we understand in a general sense to mean all and every tool, whereby movement or combination of its parts certain arithmetical operations can be done in a mechanical way. In this definition such a machine cannot be very simple, but must consist of several parts, because otherwise movement or combination of its parts cannot take place.

Tables that are calculated for certain instances only, measurement sticks, can be regarded as mere tools, but not as machines. In that sense the simple lever in itself is only a tool, but becomes a machine through its connections. *Harnessing advanced calculations is no simple venture:* Hahn undertook the first attempts at a calculating engine already in the summer of 1770, though many of his ideas, as he says, failed, notably very difficult case where one wants to add 1 to 9999. That is exactly the failure I found in all the machines described so far. After many years of troubled effort he finally conquered the difficulty and in the year 1778 he created his calculating machine."

Step by step, wheel by wheel they piece together the algorithm in matter. This is where western civilisation sets itself apart: mechanisation. The Chinese, the Indians, the non-industrialised civilisations never opted for this way of regarding life. There seems to be a link between numbers and machines. The urge to represent the world in numbers, and manipulate this representation according to its own rules is something strongly present in Western science. Here no longer the natural world, but patterns and consistencies in an inner, abstract world are of primary importance. Machines become abstract ends in themselves, faster and faster. Dijksterhuis describes this beautifully in his *Mechanisation of Culture.*

But how ignorant were other cultures? Bisschoff briefly mentions the Chinese abacus from a travel description published in 1742 as possibly the oldest known calculating tool known to

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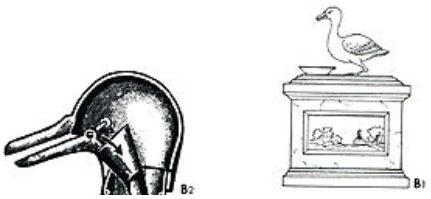

Mediamatic Magazine vol.7#1: Remko Scha 1992 1

Virtual Voices (1)

Mimesis

Mediamatic Magazine Vol. 6#2/3: Bert Mulder 2

Mulder

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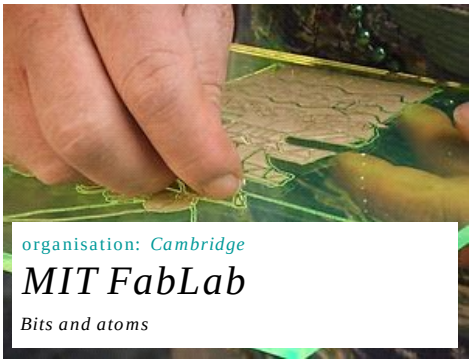

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by Howard Rheingold

Virtual Reality is catapulting us far into the 21st century.

KJO6 Sprekers

Zij zijn komen spreken tijdens Kom je ook? 6 - Oops

Voor deze editie hebben we sprekers gevonden die bereid zijn te vertellen over hun fouten, zodat wij daarvan kunnen leren....

man.

But in Werner Künzel's book on Leibniz we find, in Leibniz' explication on binary arithmetic (published in 1703) on page 87 and 88 a description of the Chinese I Ching as a system of ordering the cosmos. Though the Chinese used these systems for divination, they never developed a scientific or mechanised culture as we know it. (Künzel's inspiring venture into the basics of western information science is reviewed in Geert Lovink's article "The Archeology of the
Computer Assemblage)."

Although Chinese counting systems appeared to be known about at that time, Indian systems were not, and Vedic algorithms go unmentioned. And though the Indian scriptures contained extensive algorithmic systems, they never aimed to mechanise them. Worse, they fell into disuse and were forgotten. They were rediscovered in this century by the Shankaracharya of Govardhana and described in his voluminous book on Vedic Mathematics. But arithmetic in Indian culture, where the powers of the human mind were of more interest than the powers of man in the natural world, carries another meaning. Joseph Howse, in his "Maths or Magic, simple Vedic arithmetic methods mentions: Quite apart from the other advantages of Vedic mathematics practice of Vedic mathematics is
particularly helpful in developing the power of attention. It has the ability to clear and refresh the mind."

Even though mathematics is still a strong discipline in India and several Noble prize winners came from that country, they never based their knowledge on this image of reality and the constant urge to work with numbers, arranging and rearranging them, pattern them and using these patterns as tools shape the world as we know it.

Western civilisation takes on the natural world as its antagonist: a human development and future, where art and science both strive to elucidate that which is essentially human.

Such is the meaning of this book: it makes us conscious of the way in which we shape the world and the stories we tell ourselves.

Today, in keeping up with the speed of development, all our attention seems to be focused on the present, and we suffer loss of meaning. Information technology interferes with our memory. We need a view that lifts us out of this and gives us material for reflection. This book does that. Turning back to the first steps, the basic concepts on which our world is so absentmindedly based suddenly creates new viewpoints, new understandings that make the future more open. It lets us look at what we are, and therefore at what we are not, something we need. It enables us to choose better futures.

The illustrations, on glossy pages in the back of the book, show tables with numbers, but also renderings of wood and metal boxes, dials, springs and wheels.
The water-colour drawings, using different greys only, are simple and almost tender in their photographic quality, created in the day that one drew to represent the outer world as it was. They draw our attention into the machines, making them almost tangible. But the book doesn't come with models, and the pages stay flat. It's our memory that makes us do that. *We* made these machines, and all the ones following them. *We* make them today, and we will make them tomorrow.

In some ways reading Bisschoffs 'attempt at a history' is like looking at a distant star. It sends us 'old light' that, when it reaches us, shows us the past in the present. Archaeology in real-time.

Contributions Bert Mulder,

Comments

Title

Vito Campanelli

Web Aesthetic

How Digital Media Affect Culture and Society

Review: Nancy Mauro-Flude 2

DEAF 04: Affective Systems seminar featuring LF:TK

*Dutch Eletronic Art Festival * Affective Systems (seminar) featuring LiveForm: Telekinetics*

Servaas 1985

The New TV

Emotional television for the future.

Jeroen Sondervan 1

MediaMatters

Nieuwe boekenserie over nieuwe media en digitale cultuur

Eric Wie

Stofzuiger en tennissport

wat is relatie tussen beide?

Comment

OK Preview Cancel

organisation: *Amsterdam*

Diep Onderzoek

Leandra Mele 2

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Dirk van Weelden 1993 1

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Mercedez Bunz 1 Jan 2001 2

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Bunz's text will focus on the different ways in which the word 'and' formats the relation between reality - which means us, the...

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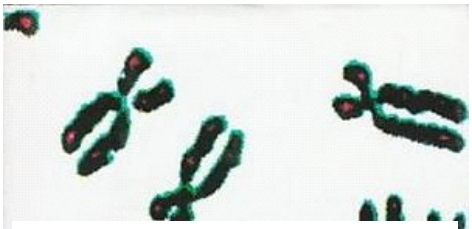
Winfried Scheuer/TV-Design

Contemplations on television design, referring to a prototype.



Book: Evelyn Fox Keller 1 Jan 1995

Refiguring Life

I like it

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