Foreword

A treatise about order in Nature, quite naturally, runs the danger of becoming very lengthy, as both concepts allow and invite a great number of observations. The present work about order in Nature attempts to be as concise, precise and to the point as possible.

The argumentation is based on numbers. The numerical facts presented are indisputable. Questions may arise, however, regarding their interpretation. The present work discusses these questions; the numbers themselves move to the background. Still, it may be quite unavoidable for the reader to reproduce, for his own use, the tables referred to herein. The tables are the "red thread" of the narrative.

The "blue thread" are the thoughts set out in enumerated paragraphs: these should help understanding the numbers. Some important keywords are highlighted light grey.

The "green thread" are the rather colloquial remarks in [square brackets]; they mobilise common sense in order to maintain a global overview. The simple illustrations accompanying the text deliver the most basic deictic definitions on the concepts discussed.

This work is dedicated to Mr. Neil J. A. Sloane, who has contributed fundamentally to the infrastructure of science by founding the Online Encyclopaedia of Integer Sequences in 1964.

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1.1 Using concepts of psychology

1.1.1 Stating the problem

1.1.1.1 Information processing in biology is different to information processing in the technological sciences.

1.1.1.2 The present treatise offers a contribution towards a harmonisation of explanations.

1.1.1.3 We will put forward an explanatory model.

1.1.2 Memory and genetics

1.1.2.1 A content of our perception may be present now, but it may also exist in a form that we all know as memory.

1.1.2.2 Genetic information can be apparent in its fully unfolded state, in the form of an organism, and also in a form which is known as DNA.

1.1.2.3 Common to both applications of information processing is that in their actualised/realised form many elements exist contemporaneously, in the same moment, while in their conserved form the elements possess at least one sequential order and therefore are not to be regarded as being present simultaneously.

1.1.3 Methodical approach

1.1.3.1 The philosophy of language concerns itself with the grammar of communications.

1.1.3.2 Natural philosophy delivers explanatory models by watching Nature, pointing the index finger towards a phenomenon observed and saying, "This I explain as follows".

1.1.3.3 Explanations will be best understood if they use words that are most generally understood and widely applied, and if the language used follows the rules of grammar to the greatest possible extent.

1.2 Hypotheses

1.2.1 Underlying principles are similar

1.2.1.1 We suppose that information processing in the brain as well as in genetics is based upon identical basic principles.

1.2.1.2 We suppose that these basic principles have to do with the simultaneous nature of incidents as contrasted with a sequenced succession of incidents.

1.2.1.3 We suppose that watching symbols which identify incidents both as simultaneously belonging to categories and as occupying sequential places within the categories will uncover insights that can be merged to form an explanation.

1.2.2 The idea is communicable

1.2.2.1 If the words are understandable and are connected according to the rules of the language, a logical sentence is generated.

1.2.2.2 Logical sentences are communicable.

1.2.2.3 Since a system of logical sentences which relate and refer to each other cannot contain anything new, the point of interest is not whether the content communicated has been understood or not, but rather whether it creates in the addressee a desire to act.

1.2.3 Expansion of arithmetics

1.2.3.1 We shall use natural numbers as demonstration objects, towards which we point our index finger while saying "this I explain as follows".

1.2.3.2 We introduce additional rules for dealing with natural numbers.

1.2.3.3 The natural numbers are assigned an additional family of logical attributes, which has not been used so far. We will investigate a part of the network of family relations among natural numbers which has so far not received any attention.

1.3 About this work

1.3.1 Philosophy of language

1.3.1.1 We continue Wittgenstein's work by speaking about logical incidents in a language that observes the rules of logic.

1.3.1.2 What is new is that we also speak about that which is not the case.

1.3.1.3 Moving the attention away from what is the case towards that which is – at the moment – not the case includes the background into the discussion; we can do so owing to the technological progress of using computers: they enhance our perception of patterns.

1.3.2 Natural numbers

1.3.2.1 There exists a tradition in natural philosophy to explain Nature by means of natural numbers.

1.3.2.2 The basic idea that Nature is something continuously changing, while largely remaining essentially the same, is also known in natural philosophy.

1.3.2.3 What is new is that we do not only regard the incidents [processes] of Nature, for which the natural numbers stand as symbols, as being subject to continual change, but we also understand the natural numbers themselves as part of a dynamic process, we think of them as being on a journey, of being in movement.

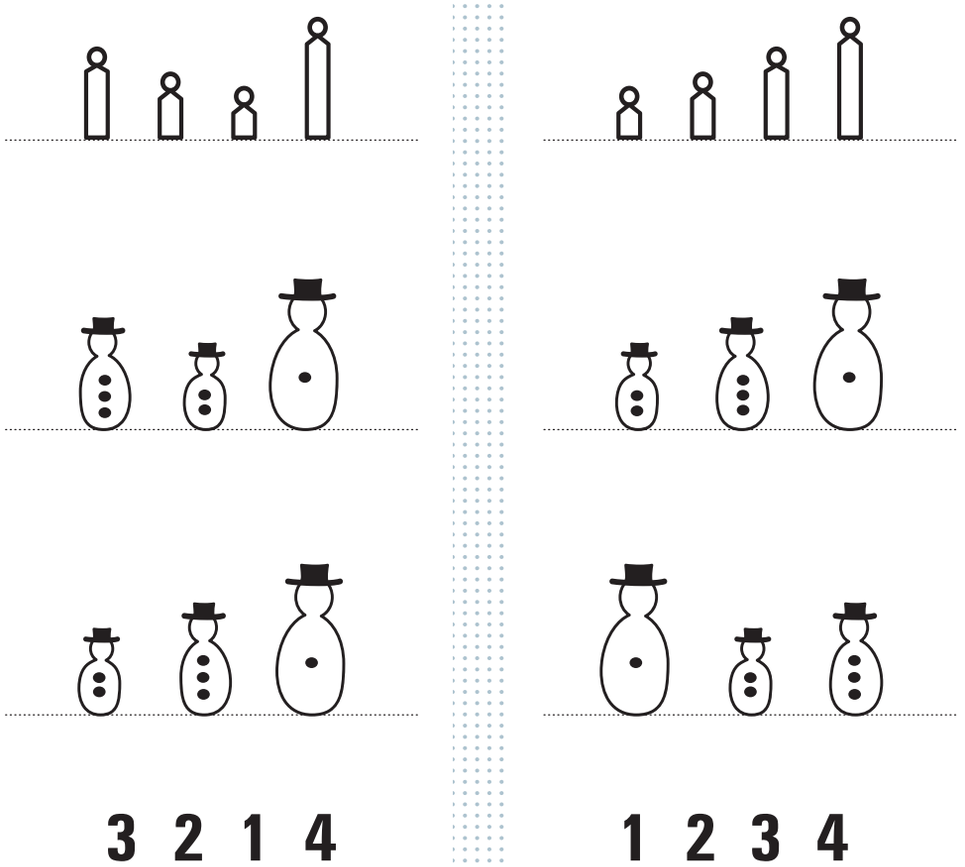
1.3.3 Loss of meaning

1.3.3.1 An exclamation of surprise has a meaning that transmits itself to the listener, whether he wants it or not. [The meaning is brought to you.]

1.3.3.2 A manual about the kinds and frequencies of exclamations of surprise will transmit its meaning only to those who are involved with the matter. [You go and get the meaning.]

1.3.3.3 A treatise about the exclamation of surprise as a subject of philosophical research, paying attention to the grammar of logical sentences and the thing as such [thing of itself], will have its meaning communicated to persons who are used to ascribing any meaning to perceptions themselves. [You make the meaning yourself.]

Figure 1.1



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2 Natural philosophy

2.1 Using a rational approach

2.1.1 Describing observations of Nature

2.1.1.1 Humans are a part of Nature.

2.1.1.2 Describing the ways humans deal with their impressions of Nature is a part of the description of Nature.

2.1.1.3 What we perceive and what we can point out is limited by the properties of our neuronal apparatus.

2.1.2 Avoiding the use of hierarchies in logic

2.1.2.1 Footnotes and explanatory remarks are superfluous in a treatise about logic, as all statements of the world view relate to each other in a conclusive and unambiguous way; all of them are equally true and equally important.

2.1.2.2 In such cases, ascribing a meaning is a proposal, as the logical symbol by itself has no meaning.

2.1.2.3 The meaning of the symbols is created through their association with emotional contents.

2.1.3 Using words that are generally understood

2.1.3.1 Persons to whom numbers speak will say that this treatise is much too long-winded.

2.1.3.2 The treatise is the more understandable, the more public the words used in it are and the better the rules of the language used are followed.

2.1.3.3 Natural numbers are a public property: anyone may recite them and point out patterns among them at his pleasure.

2.2 Each new generation needs a reformulated catalogue of the same problems

2.2.1 The basic questions remain the same

2.2.1.1 Every day one may ask oneself how charming or gruesome Nature will turn out to be.

2.2.1.2 How can we explain the eternal wheel of the changing same that incessantly generates something new?

2.2.1.3 Does there exist a model of thought in which time, space, matter and causality are cooperating with each other?

2.2.2 Historically, a process of alienation takes place

2.2.2.1 In previous times, forests, seas, lakes and skies were inhabited by creatures people believed in. [No trolls live under bridges these days.]

2.2.2.2 The reification of the processes of production, the estrangement from what was handed down, is visible also in the de-anthropomorphisation of models of explanations of the world. [In a life driven by facts and results, no place is left for trolls.]

2.2.2.3 The process of objectification [de-romanticisation] of the explanatory models of the world which we have observed in the course of history will be sustained and advanced by a model that presents major driving principles of Nature as consequences of some properties of natural numbers. [In a rational model of Nature there is no room for trolls.]

2.2.3 This generation has its own set of technical advances

2.2.3.1 Seeing the planet Earth from an outside perspective makes one understand our forefathers, who have developed the idea of infinity as a concept, but also gives rise to the idea that many – but definitely not infinitely many – interacting parts form a whole. [What can exist in an infinite amount, number, quantity, etc. on this small planet?]

2.2.3.2 We use tools, among them computers, to observe Nature, as human perception has its limits. [In time-lapse recordings or under a microscope we can see processes that remain hidden to the naked eye.]

2.2.3.3 The use of technical devices allows us to develop explanatory models which could not have been elaborated in the past, as it is impossible to calculate such a large number of factors using only pencil and paper. [To see the patterns we discuss, we have to use a computer.]

2.3 All ideas are embedded in a social-emotional context

2.3.1 All good comes from above

2.3.1.1 The experience of direction is the basis for any kind of sequencing.

2.3.1.2 Due to the effects of gravitation, humans know what the terms "above – below", "earlier – later", "is caused by" mean. [We learn as children that "down" is where things fall when we drop them.]

2.3.1.3 Since Newton, the definite direction of space, which goes through areas and places, plus the causality prevailing in this space, have defined rational thinking. [If you do not understand that the Earth pulls the apple from the tree, you cannot take part in a rational conversation.]

2.3.2 Social norms determine what is important

2.3.2.1 We learn at elementary school what is important about *a* and *b* [namely that they add up to *[a+b=c]*.

2.3.2.2 All logic is built on our experiences with dummy or pacifier, rattle and toy blocks.

2.3.2.3 A computer is a very capable child: we teach this mechanical child some games which we ourselves are not able to play, because we lack the processing capacity of a machine.

2.3.3 Preferences by the nervous system

2.3.3.1 Our traditional culture of arithmetics has evolved organically, serving us. [Mathematics is a tool made by humans for humans; if we had e.g. 4 hands with 6 fingers each, we would probably have a numbering system based on 12.]