



The Language of the Brain Not the Language of Mathematics

John Von Neumann

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Pursuing this subject further gets us necessarily into questions of language. As pointed out, the nervous system is based on two types of communications: those which do not involve arithmetical formalisms, and those which do, i.e. communications of orders (logical ones) and communications of numbers (arithmetical ones). The former may be described as language proper, the latter as mathematics.

It is only proper to realize that language is largely a historical accident. The basic human languages are traditionally transmitted to us in various forms, but their very multiplicity proves that there is nothing absolute and necessary about them. Just as languages like Greek or Sanskrit are historical facts and not absolute logical necessities, it is only reasonable to assume that logics and mathematics are similarly historical, accidental forms of expression. They may have essential variants, i.e. they may exist in other forms than the ones to which we are accustomed. Indeed, the nature of the central nervous system and of the message systems that it transmits indicate positively that this is so.

We have now accumulated sufficient evidence to see that whatever language the central nervous system is using, it is characterized by less logical and arithmetical depth than what we are normally used to. The following is an obvious example of this: the retina of the human eye performs a considerable reorganization of the visual image as perceived by the eye. Now this reorganization is effected on the retina, or to be more precise, at the point of entry of the optic nerve by means of three successive synapses only, i.e. in terms of three consecutive logical steps. The statistical character of the message system used in the arithmetics of the central nervous system and its low precision also indicate that the degeneration of precision, described earlier, cannot proceed very far in the message systems involved. Consequently, there exist here different logical structures from the ones we are ordinarily used to in logics and mathematics. They are, as pointed out before, characterized by less logical and arithmetical depth than we are used to under otherwise similar circumstances. Thus logics and mathematics in the central nervous system, when viewed as languages, must structurally be essentially different from those languages to which our common experience refers.

It also ought to be noted that the language here involved may well correspond to a short code in the sense described earlier, rather than to a complete code: when we talk mathematics, we may be discussing a secondary language, built on the primary language truly used by the central nervous system. Thus the outward forms of our mathematics are not absolutely relevant from the point of view of evaluating what the mathematical or logical language truly used by the central nervous system is. However, the above remarks about reliability and logical and arithmetical depth prove that whatever the system is, it cannot fail to differ considerably from what we consciously and explicitly consider as mathematics.

John Von Neumann