

THE OUTCOMES OF LOGICAL ANALYSIS ARE UNPREDICTABLE

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THE PROBLEM FOR PHYSICS

Light and sound waves are ruled by law of nature relationships that apply to variables like wavelength of electromagnetic radiation, and air pressure and density. No matter whether the light and sound waves are coming from a roaring tiger or a colourful songbird, the equations that represent the lawful relationships between the variables are unchanged.

But a roaring tiger will be represented by a different set of *numbers* for the variables to the set of numbers that represent a colourful songbird. And clearly, living things need to be able to respond differently to these different sets of *numbers*. Living things acquire light and sound information from their eyes and ears, and analysis of the incoming numbers is the only way for the living thing to determine if they are encountering a roaring tiger or a colourful songbird.

However, physics does not have any theoretical backing for the idea that an outcome could be a response to the *logical analysis* of a set of incoming numbers. This logical analysis and its associated outcome can only be represented (often only *after the fact*) as IF...THEN... statements.

Laws of nature are represented by fixed relationships between the variables, so that given the incoming numbers for the variables, the numeric outcomes should be predictable. But if an IF...THEN... logical analysis of the incoming numbers for the variables has taken place, not all the numeric outcomes for the variables representing the outcomes for the living thing will be predictable.

The problem for physics is that logical analysis (of the *numbers*), and the response to this logical analysis, is a fundamentally different aspect of the world to the aspect of the world that is represented by law of nature relationships (between the *variables*). The problem for physics is that analysis of the numbers is separate and distinct from relationships between the variables.

LOGICAL ANALYSIS AND ITS OUTCOMES CAN'T BE DERIVED FROM THE LAWS OF NATURE

When a person or living thing undertakes a logical analysis of their immediate situation, or a physics mathematical or philosophical problem, or even the wider climate situation in the world, and acts on the basis of this logical analysis, then at least some aspects the outcome will *not* be due to laws of nature. Any part of an outcome that is a response to an IF...THEN... logical analysis of a situation is a part-outcome *not* due to laws of nature.

This is because neither the IF... part nor the THEN... part of logical analysis can be derived from the equations that physics uses to represent laws of nature. Logical analysis is an aspect of the world that can't be explained by physics, mathematics or philosophy, and yet to do physics, mathematics and philosophy requires logical analysis.

And clearly, life could not have evolved without the pre-existence of at least a small ability to logically analyse (what we would represent as) the numbers associated with the variables, and an ability to respond to this analysis.

Human beings take logical analysis for granted; they don't recognise logical analysis as something that is absolutely necessary to make the world work. The problem for physics is that analysis of the numbers can't be derived from relationships between the variables.

COMPUTERS/ AIS DON'T DO LOGICAL ANALYSIS AND DON'T DECIDE ON OUTCOMES

It is important and necessary to point out that computers/ AIs don't do logical analysis, and don't decide on outcomes.

Firstly, a computer/ AI knows nothing about the information it is processing. From the point of view of a computer/ AI (not that it actually has a genuine point of view), binary digits are an uncrackable code, several layers of an uncrackable code. Computers/ AIs can't know that their high and low voltages are meant to represent zeroes and ones, and that these zeroes and ones are part of a binary digit system of representation. And computers/ AIs can't crack this binary code: they can't know that groupings of these high and low voltages are meant to represent letters, words and sentences in a language (like Indian, French, English or Chinese), and numbers. And the computer/ AI is not devoting resources to cracking this binary code; at all times the computer/ AI is doing nothing but following the path determined by the computer programmer's program.

Secondly, computers/ AIs don't ever make decisions about outcomes. Every possible type of input has been anticipated, and every possible type of decision in response to this input, has been determined at a high level by the computer programmers and analysts. IF...THEN...ELSE...THEN... computer programs are written to represent the high-level method of analysis of the inputs, and the decisions in response to that analysis, of the analysts and computer programmers. If an error occurs, then it is because these people failed to anticipate possible inputs and/or because the coding represents the unconscious biases of these people. Who is liable for a death caused by a self-driving car? No one is saying that computers or AIs themselves are liable.

The THEN... bits, i.e. the decision bits in a computer program, are not a natural, logical or lawful consequence of the IF... bits: for a given IF... bit in a computer program, you could associate any number of different THEN... bits. The THEN... bits represents the computer programmers' and analysts' high-level decisions, which exist in the context of what these people are trying to achieve with the whole computer system.

Computers/ AIs never do logical analysis and never make decisions: internally, the high and low voltages merely follow a path determined by the high-level rules for handling the inputs that are written into the computer program by the computer programmers.

