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Introduction

Intelligence is capable of transcending natural limitations, and of transforming the world in its own image.

In human hands, our intelligence has enabled us to overcome the restrictions of our biological heritage and to change ourselves in the process. We are the only species that does this.

The story of human intelligence starts with a universe that is capable of encoding information.

This was the enabling factor that allowed evolution to take place.

The story of evolution unfolds with increasing levels of abstraction.

The mammalian brain has a distinct aptitude not found in any other class of animal. We are capable of *hierarchical* thinking, of understanding a structure composed of diverse elements arranged in a pattern, representing that arrangement with a symbol, and then using that symbol as an element in a yet more elaborate configuration.

The primary idea in my three previous books on technology is that an evolutionary process inherently accelerates (as a result of its increasing levels of abstraction) and that its products grow exponentially in complexity and capability.

I call this phenomenon the law of accelerating returns (LOAR), and it pertains to both biological and technological evolution.

Transcendent Abilities (Chapter 6)

Clearly part of what we regard as aptitude is the product of nurture, that is to say, the influences of environment and other people.

Mozart was born into a musical family... There is clearly a nature component as well.

Neocortical abilities: for example, the ability of the neocortex to master the signals of fear that amygdala generates (when presented with disapproval)

There are other skills that contribute to degrees of competency, whether of the routine variety or of the legendary genius.

Neocortical abilities play a significant role, as do attributes such as confidence, organizational skills, and the ability to influence others.

A key aspect of creativity is the process of finding great metaphors. Symbols that represent something else.

The neocortex is a great metaphor machine, which accounts for why we are a uniquely creative species.

Every one of the approximately 300 million pattern recognizers in our neocortex is recognizing and defining a pattern and giving it a name, which in the case of the neocortical pattern modules is simply the axon emerging from the pattern recognizer that will fire when the pattern is found.

That symbol in turn then becomes part of another pattern. Each of these patterns is essentially a metaphor.

The recognizers can fire up to 100 times a second, so we have the potential of recognizing up to 30 billion metaphors a second.

Of course not every module is firing in every cycle. But it is fair to say that we are indeed recognizing millions of metaphors a second.

The mind as computer (chapter 8)

Quoted from John Allman:

Brains exist because the distribution of resources necessary for survival and the hazards that threaten survival vary in space and time.

Quoted from John Von Neumann:

In mathematics, you don't understand things. You just get used to them.

The issue of whether or not the computer and the human brain are at some level equivalent remains controversial today... Computers are not word processors. It is true that a computer and a word processor exist at different conceptual levels, but a computer can become a word processor if it is running word processing software and not otherwise.

Similarly, a computer can become a brain if it is running brain software. That is what researchers including myself are attempting to do.

The question, then, is whether or not we can find an algorithm that would turn a computer into an entity that is equivalent to a human brain.

There is actually one genuine forerunner to Von Neumann's concept, and it comes from a full century earlier!

English mathematician and inventor Charles Babbage's (1791 – 1871) Analytical Engine, which he first described in 1837, did incorporate von Neumann's ideas and featured a stored program via punched cards borrowed from the Jacquard loom.

Thought experiments on the mind (chapter 9)

Quoted from John Marvin Minsky:

Minds are simply what brains do.

Quoted from Joseph Brodsky:

The real History of consciousness starts with the first one's first lie.

One view is that philosophy is a kind of halfway house for questions that have not yet yielded to the scientific method.

When discussing consciousness, it becomes very easy to slip into considering the observable and measurable attributes that we associate with being conscious, but this approach misses the very essence of the idea.

I just mentioned the concept of metacognition – the idea of thinking about thinking – as one such correlate of consciousness.

My own view, which is perhaps a subschool of panprotopsyism, is that consciousness is an emergent property of a complex physical system.

In this view a dog is also conscious but somewhat less than a human.

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