

Thoughts of an Old One

Will Broaden Madden

Abstract

This is a science-fiction short story. It contains technical terms but also language that, at times, is almost poetic. The subjects discussed are ones that may very well occur. Some of the subjects are on the near horizon of physics and biological science and others lie far on the other side of the globe of the scientific understanding of reality. Major sections of this entire piece are separated by three asterisks; major sections of the story itself are separated by a single asterisk; minor sections of the story itself are paragraphed. References (denoted by numbers in superscript), are listed at the end of the story.

This is dedicated to Richie Kavanagh.

“Visualizing entire neuronal networks for analysis in the intact brain has been impossible up to now. Techniques like computer tomography or magnetic resonance imaging (MRI) do not yield cellular resolution, and mechanical slicing procedures are insufficient to achieve high-resolution reconstructions in three dimensions... we present an approach that allows imaging of whole fixed mouse brains. We modified ‘ultramicroscopy’ by combining it with a special procedure to clear tissue.”

“... it should be possible to analyze complex neural networks, for example, in the neocortex. Finally, computer-animated voyages through body and brain will no longer remain a vision but become reality.”

Prof. Dr. Hans Ulrich Dodt of Vienna University of Technology¹

"... time and space are modes by which we think and not conditions in which we live."

Prof. Dr. Albert Einstein

I wonder whether I will dream.

Through the great gap of eternity I sail, tomorrow. I hope that I will survive the trip; I hope that I will wake up. In a sense, however, I will sleep forever.

I wonder whether I will dream.

It is very dark and lonely now. The sunsets I see are the dying accretion disks surrounding the last black holes. My stars are quiet, dim photon spheres.

After my trip, I hope to re-awaken, mass having re-condensed, life having re-evolved, to find myself received and interpreted by some unknown civilization's eye upon their sphere of the new Universe. I will awaken to at least 70 sextillion new dawns...

Landing stations were sent in interesting directions out of our solar system. On these stations were radio signal receivers, various scientific instruments and large computer arrays. Some of the more elaborate ones had manufacturing plants. The plants could build robots into which could be transferred the consciousness of some person wishing to truly experience the deep space environment of the landing stations, to really be there.

After what by some standards would have been a little while, physical interstellar travel became impossible, owing to the expansion of the Universe.

A version of Penrose's idea² has become the general consensus opinion. 'Safe' trajectories have been decided upon and those who wish it can be sent out in the form of electromagnetic radiation, encoded with the Arecibo-2 message, on a one-way trip into the eternal void. In a sense, we will sleep forever, as photons do not experience time.

The idea is that matter in the Universe, having expanded to a certain extent, dissipates. It ceases to exist. It becomes electromagnetic radiation. Then, initial conditions are set up for the next Universe in this grand sea of radiation and, through a single root quantum fluctuation, matter violently comes back into existence and a new Universe is born. Electromagnetic radiation is the sole survivor. Ideas, not things, are eternal.

When I was young, I used to own a small, pocket-sized F.M. radio receiver. It was a small thing that fitted neatly in my hand. It was a reassuring thing of plastic, metal and some other things. In my innate, ancient, human nature I still have a sense of material worth. Now, as I stand at the gates to eternity, I miss it.

We are our thoughts.

I was one of the early ones. Later ones did not have to die to be re-born. I was still conscious when I saw the machines of my demise and rebirth activate and begin to move, though the drugs had dimmed my senses. The steel arms protruded as the arms of a mantis, gracefully and menacingly.

The initial problems after the great discovery of the brain-scanning technique were how to successfully vary the 3-dimensional representation of the brain in such a way as to allow all memory and other operations to function realistically⁴ and how to connect to the inputs and outputs of the brain. We had to avoid synesthetic problems or dichotic pitch or tinnitus, or, in worse cases, psychosis, among a vast array of other annoyances. In the grand scheme of things, these were small problems and merely amounted to a polishing of our newfound philosopher's stone.

My brain was carefully removed, along with neuron selections from other areas of the body. With the care and perseverance of the computer surgeon, my brain was dehydrated, rendered transparent (using both clearing solution [benzylalcohol in two parts benzylbenzoate] and a lipophilic phase), labelled with green fluorescent protein and then scanned, layer by layer (optical section by optical section) using a camera (to the resolution of several hundred billionths of a metre, using advanced adaptive optics) and a specialised double-laser system (using super-slit apertures). Then, my brain was physically sliced and scanned again using a scanning electron microscope (to the resolution of tenths of billionths of a metre). The digitised versions of my brain merged and combined³ into one superb representation. The computerised simulation of my neuronal network was started...

and I ceased to be human.

I have seen beauty, I have seen most of the grand elegance of reality, but I did not need to live thus far to have the ancient black veil of space obscure it. The elegance can be glimpsed through an understanding of the Maxwell equations, through an understanding of the meaning of Einstein's $m=E/c^2$, through an understanding of the cleverness of the Dirac equation, through an understanding of Plato's glorious world of the mind through Euler's identity, $e^{i\pi} = -1$.

I wonder whether I will dream. One young night of dreaming can shatter a mind. What would an eternity do?

So, I sleep... and I look forward to a new golden dawn...

*

I wake up.

Where am I?

... the Very Large Array?... In "New Mexico"?...⁵

References

- 1 “Ultramicroscopy: Three-dimensional visualization of neuronal networks in the whole mouse brain”, H.-U. Dodt, U. Leischner, A. Schierloh, N. Jährling, C.P. Mauch, K. Deininger, J.M. Deussing, M. Eder, W.Zieglgänsberger & K. Becker, Nature Methods 04/2007
- 2 “The Road to Reality: A Complete Guide to the Laws of the Universe”, Roger Penrose
3. “Principles of Computerized Tomographic Imaging”, Avinash Kak & Malcolm Slaney (1988), IEEE Press, ISBN 0-87942-198-3
4. “Rearrangements of synaptic connections in visual cortex revealed by laser photostimulation”, M. B. Dalva & L. C. Katz, Science 265, 255-258 (1994)
5. The Very Large Array (VLA) is an astronomical radio observatory located on the Plains of San Augustin, between the towns of Magdalena and Datil, approximately 80 kilometres west of Socorro, New Mexico, USA.