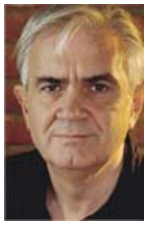

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Soul Searching

Sunday Times, 18 March 2012

When she was 16, Nina Sellars had one of the first MRI scans in Australia. It revealed a tumour on the pineal gland at the centre of her brain — the site of the human soul, according to the philosopher Descartes. After an operation, Sellars was blind for 18 months. She had been ready to take up a music scholarship, but, when she recovered her sight, something had changed: "It was disturbing. Some people have a phantom limb — I had phantom eyesight. I didn't feel comfortable with what I was seeing. Everything had lost its dimensions."

She is now 40, with normal eyesight and has become an internationally established artist. One of her pictures, Scan, memorialises her MRI and her operation. It shows an empty skull from above. At the back, where a 10cm square panel had been cut in her head by the surgeons, there is a gap in the bone filled by a QR barcode (the square kind you can use to check in at airports). "I replaced the brain with a QR code, which is a body of information. Our bodies are now being translated so much into images that we are becoming more insubstantial as we are becoming more transparent."

Scan will be shown at Brains: The Mind as Matter, an exhibition opening this month at the Wellcome Collection. The show does exactly what it says on the tin: it looks at the way scientists and, increasingly, artists have explored the brain as a material object. It is about, in the words of its curator, Marius Kwint, "a physical encounter with the brain… We look at it the way we might look at the use of wood in culture — chopping, slicing, freezing".

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Be warned: Kwint points out that this can get gory. There is, for example, a film of a brain being dissected. "It is quite a powerful thing when the knife goes through the brain. Quite a lot of aspects of culinary technology are used, like breadboards and a big knife. It's quite a fascinating, low-technology process."

A knife in the brain is more shocking than, for example, a knife in the liver because we have become acclimatised to the idea that our true being resides in this soft grey and white matter. The idea that we are, in some as yet unknown way, our physical brains has penetrated mass culture in the image of the "brain in the jar". In the popular sci-fi-inspired imagination, we could continue to exist as mere brains separated from our bodies. It is a theme that reaches its comic climax when Steve Martin falls in love with a brain in a jar, in the film The Man with Two Brains (1983). Disembodied romance is a joke, but, thanks to our modern sense that our souls are made of soft tissue, it is not simply funny.

This anatomistic sense of self inspires artists as well as scientists. Prior to x-rays and MRI scans, anatomy was always a subject that brought together scientists and artists, simply because somebody had to do the drawings. Vesalius, the great 16th-century anatomist, employed Jan Stephen van Calcar, a pupil of Titian, to illustrate his masterpiece On the Fabric of the Human Body. Joseph Town, a 19th-century classical sculptor, also produced astonishing wax skeletons.

Or, almost in our time, there are the exquisite drawings of Audrey Arnott. She was the medical illustrator for the neurosurgeon Hugh Cairns. Her drawings are striking for their anatomical perfection, but also, strangely, for their poignancy. She draws the patients as fully realised characters, a disturbing effect when the brain is almost fully exposed.

Then there is the fashion photographer Corinne Day, who, having been diagnosed with a brain tumour, arranged for the ensuing medical processes to be pictured in unflinching detail. The doctors could not save her; Day died of the tumour in August 2010.

And, though it was not intended as art, one of the most sculpturally dramatic images in the Wellcome show is a "corrosion cast" of the brain's blood vessels. This is made by injecting a rapidly hardening plastic into the veins and arteries, then corroding away the flesh in acid. What is left is an astonishing brilliant-red bush, the armature of the self.

Perhaps the most resonant image seen in London recently was a Leonardo da Vinci drawing at the National Gallery. This showed the interior of a man's head as almost entirely empty. Leonardo believed that human thought resided in the ventricles — voids — in the brain. The workings of the mind were simply too fleeting to be trapped in ordinary matter. Our modern idea that it must be found in the soft surrounding tissue would have seemed absurd to him.

No subject could be more topical. A few years ago, the most familiar image of science was the double helix of the DNA molecule. Genetics became the hot science of the moment, reaching a climax with the deciphering of the human genome in 2003. Here, it was thought, we would find the physical basis of what it was to be human — our souls would at last be laid bare on the laboratory bench. Thanks to the double helix, it all looked so simple.

At once, there were problems. For a start, there was the shocking discovery that we had only 23,000 genes, 40% fewer than corn. It had been thought that we had at least 100,000. And the entire genome was only 2% as big as that of the flower Paris japonica. How could human complexity be explained by such meagre genetic information? Furthermore, the expected medical benefits did not appear as quickly as promised. The totem pole of the double helix began to look distinctly disappointing.

Then, thanks to rapid improvements in brain-scanning technology and the resulting flood of news from neuroscientists, a new totem of contemporary science at once became available — the human brain, as revealed in livid detail by the MRI scanner. This, surely, must contain the human mind, if not the soul. Now, with scanners and scalpels, we can take man and, in the words of the poet Wallace Stevens, "lay his brain upon the board/And pick the acrid colours out". Well, maybe. These are early days. The neuroscientist Colin Blakemore has compared our present scanners to the telescope used by Galileo. "The smart neuroscientists agree," Kwint says, "that we haven't really got very far in relating structure to function. Steven Rose [a neurobiologist] says that brain science is data-heavy but theory-light".

The difficulties — and, perhaps, impossibilities — of finding the mind or the soul in the physical structure of the brain will be discussed (full disclosure) in a series of three conversations I will be conducting with Iain McGilchrist, Matthew Taylor and Raymond Tallis, to run alongside the Wellcome exhibition. The show provides the evidence for the case to be heard, but the jury is expected to be out for some years yet.

As far as science is concerned, the next step is to look at the brain not as a product of the genes, but rather as a product of its trillions of connections. This is the rising science known as "connectomics", and it seems to suggest that the brain is determined more by nurture than by nature.

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Whether it will be a soul at all, or just the product of the workings of a phenomenally complex machine consisting of about 1.5kg of, primarily, fat and water, is the big issue. The materialist view is that, of course, it must be. It is this view that, since the 19th century, has defined but also frustrated brain science. The strong materialist conviction is that we can find consciousness and all the other attributes of human beings by looking at the physical structure of the brain. Once this was done crudely by weighing the brain of (dead) prominent figures. Anthropometrists, as they were known, were convinced that lower humans — "the average bushman" — had brains weighing as little as 1kg. When it was found that the brain of the great French statesman Léon Gambetta weighed only 1.16kg, the discipline was on the slide.

More subtle attempts were made to find Lenin's genius in his brain, but these were discredited, as were similar claims about Einstein's brain — you can see slices of the latter at the Wellcome show. These also went nowhere, not least because the subjects, being dead, could not report on their thought processes.

The Harvard doctor Harvey Cushing, a star of the Wellcome show and the godfather of modern neurosurgery, had, from the start of the 20th century, begun to change all that by intervening directly in the brains of the living; then, finally, along came scanning, which could show brain activity in real time and therefore correlate brain states with mind states.

To be frank, scanning does not yet really work. As a medical tool, it is unsurpassed — Nina Sellars can testify to that — but as a soul-searching mechanism, it is still outclassed by theologians and artists. I had a 2½-hour scan while researching my book The Brain Is Wider Than the Sky, but most of the results were either anomalous or simply bizarre. Reciting poems I loved or recounting painful memories produced no response in the areas of my brain that are supposed to handle emotions. Some, however, seemed very accurate. My sense of humour was, sadly, pretty much mainstream.

For artists, the issue is to turn this new form of soul-searching into some kind of synthesis of the way we feel now about human identity. The fact that we may — or may not — be poised to discover the roots of our being is cunningly captured by the Wellcome's use of contemporary art. The primary image, Headache, by Helen Pynor, shows a detailed and very modern picture of the brain combined with some very poor and ancient advice: "Press brown paper soaked in vinegar against the forehead."

Now we have scanners, soul-searchers, that show us — what, exactly? A mass of grey and white fat and water, illuminated by little electric shocks. If that is us, then Sellars got it exactly right when she said: "We are becoming more insubstantial as we are becoming more transparent."

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One Response to "Soul Searching"

1. *David Simmonds* Says:

   20 March 2012 at 9:39 am

   Thank you so much for this illuminating article. I will certainly go to see the exhibition at the Wellcome Collection. It will inform my own research into the nature of learning.

   Meanwhile, when will you be having your series of three conversations with Iain McGilchrist, Matthew Taylor and Raymond Tallis?

   David

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