



The Divided Brain and the Making of the Western World

Iain McGilchrist

*Iain McGilchrist presents the second part of his thesis explained in his recently published book **The Master and his Emissary: The Divided Brain and the Making of the Western World**, reviewed later in this issue. His background in English literature and medicine gives him a unique perspective on the relationship between brain and culture.*

In the April issue I suggested that there was a reason that the brain is divided. It seems, in animals, that there is a need to keep certain ways of attending to the world apart. In animals and birds left hemisphere attention enables them to focus narrowly on something that is needed. It is purposeful and has an object – a grain of seed, or another animal that forms its prey. At the same time right hemisphere attention is as open as possible to the world at large, to whatever there is, without design or preconception: helping them watch out for predators, but also to seek out those to whom they have an attachment, mates and kin.

In man, too, the right hemisphere provides a broad attention that takes in the whole of the available world, while the left hemisphere has a narrowly focussed beam of attention, focussed for the purposes of grasp, the function of the right hand. And this has untold consequences for the sort of world each creates for us. Attention is the basis of our experience of the world. It is not a 'function' alongside other functions, but the basis for having a world at all, in which those 'functions' can be exercised. And, though it is true that what it is we are attending to determines the type of attention we pay, it is also importantly true that the type of attention we pay determines what it is we see. The way reality comes into being for us is like that famous picture by M C Escher of hands that draw hands:



The Two Hemispheres: Recent Advances in Neuroscience

So what has the exponential growth in brain research over recent years actually revealed about hemisphere differences? And what sort of a world does each create for us? Here I am going to have to summarise what we know in almost telegraphically compressed form. All I can say is that the evidence is in my view both extensive and convincing, and those who are interested will find the detail in my book.

As if to confirm that there is something quite distinct about the ways the hemispheres work, we might just note that there are differences in their structure and function at the most basic level. The right hemisphere is longer, wider, and generally larger, as well as heavier, than the left, a finding that applies to all social mammals. The hemispheres also differ in their sensitivity to particular neurotransmitters and neurohormones, as well as in the neuronal architecture and organisation, in ways that make sense in terms of the neuropsychological differences. And what are they?

In the first place the nature of right hemisphere attention means that whatever we experience comes to us first – it 'presences' to us in unpreconceived freshness – in the right hemisphere. New experience of all kinds – whether it be music, words, imaginary constructs, objects in the environment, even skills – comes to us first from the right hemisphere, and is only later dealt with by the left hemisphere once it becomes familiar.

The right hemisphere is better at making connections between things: it tends to see things whole, where the left hemisphere sees the parts. This has further consequences. The left hemisphere tends to see things more in the abstract, where the right hemisphere sees them more embedded in the real world context in which they occur. As a corollary, the right hemisphere seems better able to appreciate actually existing things in all their uniqueness, where the left hemisphere schematises and generalises things into categories. But since much of what matters in experience depends ultimately on not being snatched from the context in which alone it has meaning, this is a vastly significant difference. All artistic and spiritual experience – perhaps everything truly important – can be implicit only; language, in making things explicit, reduces everything to the same worn coinage, and, as Nietzsche said, makes the uncommon common.

There is a mass of evidence that the left hemisphere is better attuned to tools, and to whatever is inanimate, mechanical, or machine-like, and which it has itself made: such things are understandable in its own terms, because they were put together by it, piece by piece, and they are ideally suited to this kind of understanding. In contrast, the right hemisphere is adapted to dealing with living things, which are flexible, organic, constantly changing, and which it has not made. The right hemisphere alone appears to be able to appreciate the organic wholeness of a flowing structure that changes over time, as in fact all living things are; and in fact almost all aspects of the appreciation of time are in the right hemisphere. By contrast, the left hemisphere sees time as a succession of points, flow as a succession of static moments, rather like the still frames of a ciné film. Everything, including living wholes, is put together from bits; and if there are no clear bits, it will invent them.

It is therefore not surprising that the right hemisphere is far more important than the left for the appreciation of music, an organic being that flows, which needs to be appreciated as a whole, and which exists almost entirely in 'betweenness'. The left hemisphere can appreciate rhythm, as long as it is simple, but little else: melody, timbre and especially harmony are all largely right hemisphere-dependent, and so are even complex rhythms, with cross-beats and syncopations (professional musicians are an exception for a number of possible reasons that are interesting in themselves).

The visual equivalent of harmony could be said to be depth of the visual field; the sense of depth is also largely right-hemisphere-dependent, in keeping with the right hemisphere's world being one from which we are not isolated, but with which we stand in an important relationship, whereas the left hemisphere tends to see things flat, detached from us, as they would be projected on a screen.

While both hemispheres are involved in the expression and appreciation of emotion, the majority of our emotional life depends on the right hemisphere: the one emotion that is robustly demonstrated to be more associated with the left hemisphere is anger, though emotions that are superficial, conscious or willed may be subserved by the left hemisphere. We express more with the left-side of the face, governed by the right hemisphere, and the left hemisphere cannot read emotional facial expression or understand or remember emotional material as well as the right. In fact the recognition of faces, discriminating their uniqueness, interpreting their expressions, are all largely dependent on the right hemisphere. Above all the right hemisphere is more empathic: its stance towards others is less competitive, and more attuned to compassion and fellow-feeling. Although it can deal well with the entire range of emotions, it is far better attuned to sadness than the left hemisphere; and studies in children confirm that the capacity for sadness and empathy are closely related.

The right hemisphere is more interested in what has personal relevance 'for me', the left hemisphere in what is impersonal. But it is still the right hemisphere that is better able to understand what is going on in other people's heads, and to empathise, than the left hemisphere, which in these respects is relatively autistic. Our sense of our self is complex, but again the sense of ourselves as beings with a past and a future, as single beings with an enduring story over time, is dependent on the right hemisphere (narrative is appreciated by the right hemisphere, whereas the left hemisphere sees a mass of discrete episodes, which it often gets out of sequence). The sense of ourselves as identified with our conscious will may be more subserved by the left hemisphere.

That our embodied nature enters into everything we do, not just our actions, or even our feelings, but our ability to reason, philosophise or engage in science, is something of

which we have become more aware in the last 100 years. The hemispheres have different ways of understanding the body. Only the right hemisphere has a whole body image; the left hemisphere sees the body as an assemblage of parts, and as if it were an object in space alongside other objects, rather than a mode of existence. For the right hemisphere, we live the body; whereas for the left, we live in it, rather as we drive a car.

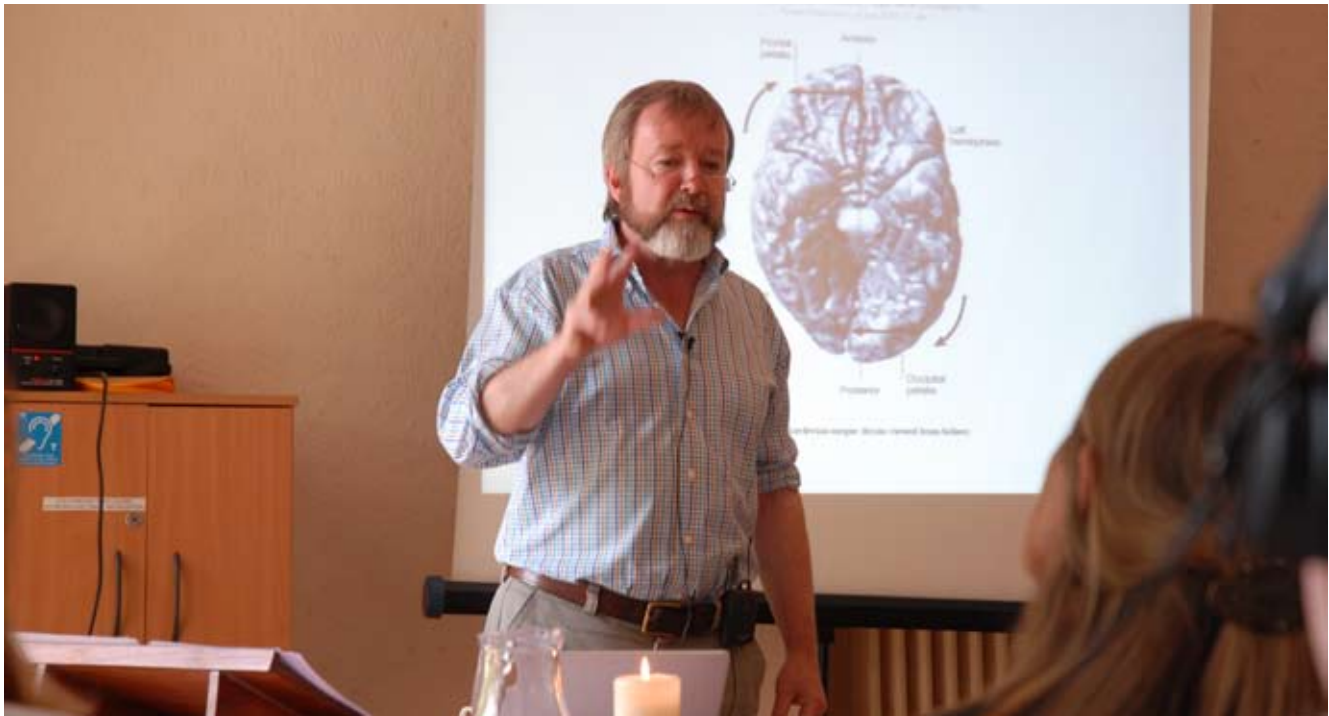
Reasoning is by no means confined to the left hemisphere, though sequential analysis largely is. Deductive reasoning, many kinds of mathematical procedures and problem-solving, and the phenomenon of sudden insight into the nature of a complex construct, seem to be underwritten by the right hemisphere, in fact by areas that cognitive science tells us are also involved in the 'processing' of emotion.

The intuitive moral sense is closely bound up with empathy for others and seems to depend on part of the right frontal cortex that is dysfunctional in psychopaths. Above all the left hemisphere is over-optimistic, unrealistically positive in its self-appraisal, and is in denial about its short-comings, unreasonably certain that it understands things of which it has little knowledge, and disinclined to change its mind. By contrast the right hemisphere sees more, but is far more inclined to self-doubt, is more uncertain of what it knows – and has no voice, since the motor speech centre (though importantly not all of language) lies in the left hemisphere.

Summarising the Differences

If one had to characterise the difference overall, it is something like this. Experience is forever in motion, ramifying and unpredictable. In order for us to know anything at all, that thing must have enduring properties. If all things flow, and one can never step into the same river twice – Heraclitus's phrase is, I believe, a brilliant evocation of the core reality of the right hemisphere's world – one will always be taken unawares by experience, since nothing being ever repeated, nothing can ever be known. We have to find a way of fixing it as it flies, stepping back from the immediacy of experience, stepping outside the flow. Hence the brain has to attend to the world in two completely different ways, and in so doing to bring two different worlds into being. In the one, that of the right hemisphere, we experience – the live, complex, embodied, world of individual, always unique beings, forever in flux, a net of interdependencies, forming and reforming wholes, a world with which we are deeply connected. In the other, that of the left hemisphere, we 'experience' our experience in a special way: a 're-presented' version of it, containing now static, separable, bounded, but essentially fragmented entities, grouped into classes, on which predictions can be based. This kind of attention isolates, fixes and makes each thing explicit by bringing it under the spotlight of attention. In doing so it renders things inert, mechanical, lifeless. But it also enables us for the first time to know, and consequently to learn and to make things. This gives us power.

These two aspects of the world are not symmetrically opposed. They are not equivalent, for example, to the 'subjective' and 'objective' points of view, concepts which are themselves a product of, and already reflect one particular way of being in the world – which in fact, importantly, already reflect a 'view' of the world, such as only the left hemisphere can take. The distinction I am trying to make is between, on the one hand, the way in which we experience the world pre-reflectively, before we have had a chance to 'view' it at all, or divide it up into bits – a world in which what later has come to be thought of as subjective and objective are held in a suspension which embraces each potential 'pole', and their togetherness, together; and on the other hand, the world we are more used to thinking of, in which subjective and objective appear as separate poles. At its simplest, a world where there is 'betweenness', and one where there is not. These



are not different ways of thinking about the world: they are different ways of being in the world. And their difference is not symmetrical, but fundamentally asymmetrical.

In my article in the April Review, I suggested that we have developed language not for communication, not even for thinking, but to enable a certain type of functional manipulation of the world. Language is like the general's map in his HQ, a representation of the world. It is no longer present, but literally 're-presented' after the fact. What it delivers is a useful fiction.

I believe the essential difference between the right hemisphere and the left hemisphere is that the right hemisphere pays attention to the Other, whatever it is that exists apart from ourselves, with which it sees itself in profound relation. It is deeply attracted to, and given life by, the relationship, the betweenness, that exists with this Other. By contrast, the left hemisphere pays attention to the virtual world that it has created, which is self-consistent, but self-contained, ultimately disconnected from the Other, making it powerful – but also curiously impotent, because it is ultimately only able to operate on, and to know, itself.

The Primacy of the Right Hemisphere

You might say, OK, here are two different ways of conceiving the world: but how do you know that they are not equally valid? I say that they are both very important – both in fact essential for our ability to lead civilised lives – but not equally valid. And there are many reasons why.

In the first place it is interesting that in the late nineteenth and twentieth centuries, both mathematics and physics (for example Cantor, Boltzmann, Gödel, Bohr), and philosophy (I am here thinking particularly of the American pragmatists, Dewey & James, and the European phenomenologists, Husserl, Heidegger, Scheler, Merleau-Ponty and the later Wittgenstein), though starting absolutely from the premises of the left hemisphere, that sequential analysis will lead us to the truth, have ended up with results that approximate far more closely to – which in fact confirm the validity of – the right hemisphere's way of understanding the world, not that of the left. That is in itself a remarkable fact, since generally speaking the preconceptions with which you start will determine where you end.

But there are other indications. Broad vigilant attention must come before we can focus on one part of the field; we see the whole before we see the parts, not put the whole together from the parts; we experience everything at first with the right hemisphere, not the left; language originates in the body, and is implicit, not something that functions at the abstract level, as something explicit; affect is primary, not the result of calculation based on cognitive evaluation of the parts; as Libet has demonstrated, the unconscious will, more closely related to right hemisphere functioning, is well ahead of anything our explicit verbalising consciousness can be aware of; careful analysis of the relationship between speech and gesture shows that both thought and its expression actually originate in the right hemisphere, not in the left; re-presentation necessarily relies on earlier 'presencing'; and even the mode of functioning of the nervous system itself is more right-hemisphere-congruent than left-hemisphere-congruent.

What the left hemisphere offers is then a valuable, but intermediate process, one of 'unpacking' what is there and handing it back to the right hemisphere, where it can once more be integrated into the experiential whole; much as the painstaking, fragmentation and analysis of the sonata in practice is reintegrated by the pianist in performance at a level where he must no longer be aware of it.

That, at any rate, is how the two should work together: the emissary reporting back to the Master, who alone can see the broader picture. But the self-consistent rationalism of the left hemisphere has convinced it that it does not need to concern itself with what the right hemisphere knows: it believes it has the whole story itself. And it has three great advantages. First, it has control of the voice, and the means of argument – the three Ls, language, logic and linearity – are all ultimately under left-hemisphere control. It is like being the Berlusconi of the brain, a political heavyweight who has control of the media. Of course we tend to listen more to what it has to say. Second, the self-consistent world of pure theory and ideas is like a hall of mirrors: all attempts to escape are deflected back within. The main paths that might have led us to something beyond – the intuitive wisdom embodied in tradition, the experience of the natural world, arts, the body and religion – are all emptied of force by the abstracting, rationalising, ironising impact of the world of self-consistent re-presentations that is yielded by

the left hemisphere. The living presence becomes no longer accessible. And, third, there is a tendency for positive feedback to come into play – instead of redressing the balance, we just get more of the same.

Which brings me to the reason we cannot just view this as of academic interest. For I believe the world in which we live has become increasingly to reflect the view of the left hemisphere alone.

The Evolution of Western Culture – A Thought Experiment

In Part II of the book, I look at the evolution of Western culture, beginning in the ancient world with the extraordinary efflorescence of culture in 6th century BC Athens, where it seems to me, the two hemispheres worked as never before or since in harmony; then at the decline associated with the rise of the left hemisphere in the late Roman empire; and then, in turn, at the seismic shifts that we call the Renaissance, the Reformation, the Enlightenment, Romanticism, the Industrial Revolution, Modernism and Post-modernism. I believe that they represent a power struggle between these two ways of experiencing the world, and that we have ended up prisoners of just one – that of the left hemisphere alone.

Let's do a thought experiment. What would it look like if the left hemisphere came to be the sole purveyor of our reality?

First of all, the whole picture would be unattainable: the world would become a heap of bits. Its only meaning would come through its capacity to be used. More narrowly focussed attention would lead to an increasing specialisation and technicalising of knowledge. This in turn would promote the substitution of information, and information gathering, for knowledge, which comes through experience. Knowledge, in its turn, would seem more 'real' than what one might call wisdom, which would seem too nebulous, something never to be grasped. Knowledge that came through experience, and the practical acquisition of embodied skill, would become suspect, appearing either a threat or simply incomprehensible. It would be replaced by tokens or representations, formal systems to be evidenced by paper qualifications.

There would be a simultaneous increase in both abstraction and reification, whereby the human body itself and we ourselves, as well as the material world, and the works of art we made to understand it, would become simultaneously more conceptual and yet seen as mere things. The world as a whole would become more virtualised, and our experience of it would be increasingly through meta-representations of one kind or another; fewer people would find themselves doing work involving contact with anything in the real, 'lived' world, rather than with plans, strategies, paperwork, management and bureaucratic procedures.

There would be a complete loss of the sense of uniqueness. Increasingly the living would be modelled on the mechanical. This would also have effects on the way the bureaucracies would deal with human situations and with society at large. 'Either/or' would tend to be substituted for matters of degree, and a certain inflexibility would result.

There would be a derogation of higher values, and a cynicism about their status. Morality would come to be judged at best on the basis of utilitarian calculation, at worst on the basis of enlightened self-interest.

The impersonal would come to replace the personal. There would be a focus on material things at the expense of the living. Social cohesion, and the bonds between person and person, and just as importantly between person and place, the context in which each person belongs, would be neglected, perhaps actively disrupted, as both inconvenient and incomprehensible to the left hemisphere acting on its own. There would be a depersonalisation of the relationships between members of society, and in society's relationship with its members. Exploitation rather than co-operation would

be, explicitly or not, the default relationship between human individuals, and between humanity and the rest of the world. Resentment would lead to an emphasis on uniformity and equality, not as just one desirable to be balanced with others, but as the ultimate desirable, transcending all others.

The left hemisphere cannot trust and is prone to paranoia. It needs to feel in control. We would expect government to become obsessed with issues of security above all else, and to seek total control.

Reasonableness would be replaced by rationality, and perhaps the very concept of reasonableness might become unintelligible. There would be a complete failure of common sense, since it is intuitive and relies on both hemispheres working together. One would expect a loss of insight, coupled with an unwillingness to take responsibility, and this would reinforce the left hemisphere's tendency to a perhaps dangerously unwarranted optimism. There would be a rise in intolerance and inflexibility, an unwillingness to change track or change one's mind.

We would expect there to be a resentment of, and a deliberate undercutting of the sense of awe or wonder: Weber's 'disenchanted' world. Religion would seem to be mere fantasy. Art would be conceptualised, cerebralised; and beauty ironised out of existence.

As a culture, we would come to discard tacit forms of knowing altogether. There would be a remarkable difficulty in understanding non-explicit meaning, and a downgrading of non-verbal, non-explicit communication. Concomitant with this would be a rise in explicitness, backed up by ever increasing legislation, what de Tocqueville predicted as a 'network of small complicated rules' that would eventually strangle democracy. As it became less possible to rely on a shared and intuitive moral sense, or implicit contracts between individuals, such rules would become ever more burdensome. There would be a loss of tolerance for, and appreciation of the value of, ambiguity. We would tend to be over-explicit in the language we used to approach art and religion, accompanied by a loss of their vital, implicit and metaphorical power.

Does that ring any bells? In terms of the fable with which I began, the emissary, insightful as ever, appears to believe it can see everything, do everything, alone. But it cannot: on its own it is like a zombie, a sleepwalker ambling straight towards the abyss, whistling a happy tune.

*Dr. Iain McGilchrist is a Fellow of the Royal College of Psychiatrists, and has three times been elected a Fellow of All Souls College, Oxford. He intended to read theology and philosophy at Oxford, but was hi-jacked into reading English literature, and published **Against Criticism** in 1982.*

He retrained in medicine in order to understand better the 'mind-body problem', and has been a neuroimaging researcher at Johns Hopkins in Baltimore and a Consultant Psychiatrist at the Maudsley Hospital



S. Pietro Martire by Lorenzo Lotto