Against Consilience: Outsider Scholarship and the Isthmus Theory of Knowledge Domains

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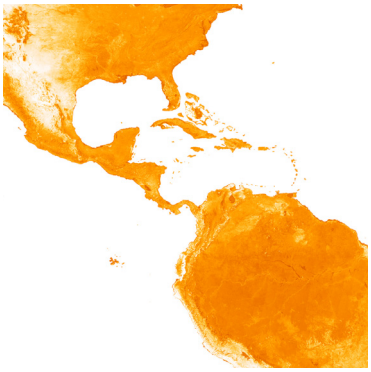

Abstract

The endless proliferation of human knowledge represents not so much a tree-structure of knowledge as the tentacles of an octopus dragging us down into anguished division. The anguish is genuine and has been expressed since the Enlightenment by many types of thinker. This paper argues however that the anguish does not in fact arise from the increasing knowledge but from the mistaken belief in the possibility of its unification. This unification, in the example of E. O. Wilson's 'consilience', is shown to represent nothing more than a takeover bid for the humanities by the sciences and the final triumph of logical positivism, all of which is couched in terms apparently irresistible to fashionable thought. An alternative 'isthmus' theory of knowledge domains is introduced as a better way of encompassing the contemporary proliferation of knowledge.

Keywords: Consilience, epistemology, isthmus theory, knowledge domain, outsider scholarship, Pirsig.

Introduction

> *Why should the division of human knowledge be a bad thing, and the putative unification of knowledge be a desirable goal? What could it mean, to walk into a university library and unify its contents? Obviously, it would mean nothing.* (King, 2009, p. 108)

Many notable thinkers have attempted to tackle what they see as the problem of the proliferation of human knowledge. What we know collectively seems to be growing exponentially in increasingly specialised sub-disciplines. But … why *is* it a problem? Philosophy at the time of Aristotle meant the mastery of all knowledge, but the Greek mode of thought was first rejected entirely by the early Church Fathers, and then later transformed under Christianity into Scholasticism, an Aristotelian thought-world subservient to religion. In the Enlightenment philosophy was freed of religion but recoiled from the natural sciences to become, not the mastery of all learning – as this was quickly becoming impossible – but the court to which all disciplines must submit their truth-claims. Unfortunately disciplines like physics didn't bother. No over-arching framework for knowledge could exist henceforth, and increasingly no individual could hope to master all knowledge.

Yet, if knowledge is a good thing, why on earth should more of it be a bad thing? Imagine a young sapling with only three branches and several dozen twigs. Do we not celebrate the mature tree, a hundred years later with a hundred branches and thousands of twigs? Why isn't the proliferation of knowledge seen in the same positive light? Clearly it isn't. One can speculate that in some sense great thinkers feel humiliated by their incapacity to master all knowledge; for example Dostoevsky was famously unhappy at being unable to acquire proficiency with the differential calculus. Whatever the reason, the consensus became that knowledge was 'fragmented', and the call has been made from many quarters to address this problem, or even to see that its solution was *the* important contemporary problem. Erwin Schrödinger, Paul Ricoeur, the Frankfurt School and Ken Wilber have all made such calls.

Schrödinger (2007, p. 1) says 'We have inherited from our forefathers the keen longing for unified, all-embracing knowledge.' He adds: 'We feel clearly that we are only now beginning to acquire reliable material for welding together the sum total of all that is known into a whole, …' At the start of a book on Freud and philosophy Ricoeur says 'We have at our disposal a symbolic logic, an exegetical science, an anthropology, and a psychoanalysis and, perhaps for the first time, we are able to encompass in a single question the problem of the unification of human discourse.' (Ricoeur, 1970, p. 3) A large part of the efforts of the Frankfurt School can be understood as the attempt to unify Marxist and Freudian thought, which in the first instance are often antithetical. Ken Wilber has worked tirelessly to devise a 'theory of everything' in which all knowledge has a home.

Schrödinger, Ricoeur and Wilber are poles apart in their respective worldviews, but share the idea of an all-embracing knowledge, the welding together of all that is known, the unification of human discourse. The precise term varies but the idea is the same. Knowledge is fragmented, and – to use the most common term here – it must be integrated. The integration of knowledge sounds in the first instance like a good thing, but what, more precisely, do its proponents claim for such integration? Turning to Edward O. Wilson, in anticipation of introducing his 'consilience' later on, it is interesting to see what motivates him. For example he says: 'only unified learning, universally shared, makes accurate foresight and wise choice possible.' (Wilson, 1998, p. 297) Clearly, he thinks that the unification of knowledge will aid *planning*. In the same vein he talks about the dropping costs of distributing knowledge, so we are 'drowning in information, while starving for wisdom. The world will henceforth be run by synthesisers …' (Wilson, 1998, p. 269). By 'synthesisers' he means people who have access to 'unified' knowledge and will be able make 'important choices wisely.' (Note that the term 'synthesis' will become increasingly important in this discussion as the alleged corollary of 'analysis'.) Everywhere Wilson confirms for us his belief in knowledge as utility, for example he says that people expect the social sciences to deliver 'the knowledge to understand their lives and control their future' (Wilson, 1998, p. 181).

For Basarab Nicolescu – a scientist with a very different agenda – the purpose of unified knowledge is similar, but it comes from another source: Marxism. Writing around the turn of the twenty-first century he says: 'The contemporary growth of knowledge is without precedent in human history' (Nicolescu, 2002, p. 6). One specialist cannot even know everything in a colleague's brain, he points out, let alone across all the disciplines. 'Yet, a true decision maker must be able to have a dialogue with all of them at once' (Nicolescu, 2002, p. 41). The 'Babelization' of knowledge, as he puts it, is dangerous, 'because the decision maker becomes increasingly more incompetent regardless of his or her intention.' Although never stated explicitly, one cannot help detecting in his work a respect for top-down planning largely absent in non-communist circles, though perhaps a common motivating factor with Wilson.

Perhaps we should now turn to physics now to discover a site of intense efforts to unify theories that have so far remained stubbornly irreconcilable. These are quantum theory and gravitation, and their would-be reconciliation is called the 'unified field theory'. Stephen Hawking's well-known popular science book, *A Brief History of Time* finishes with a short paean to its virtues:

> However, if we do discover a complete theory, it should in time be understandable in broad principle by everyone, not just a few scientists. Then we shall all, philosophers, scientists, and just ordinary people, be able to take part in the dis-

> cussion of the question of why it is that we and the universe exist. If we find the answer to that, it would be the ultimate triumph of human reason – for then we would know the mind of God. (Hawking, 1988, p. 175)

These are an astonishing set of claims – all totally unfounded. In particular, the idea that the solution of the most difficult problem in physics – a problem that takes a person decades of scientific study to even understand as a *problem* – would yield something comprehensible to lay people is mystifying. After all the great British thinker John Locke could not comprehend a key text at the dawn of modern physics, the *Principia* of his friend Newton. But the grandiosity of Hawking's statement is not unique, and is typical of the way some scientists talk. Wilson expresses the same idea, only a little less grandly: 'When we have unified enough certain knowledge, we will understand who we are and why we are here' (Wilson, 1998, p. 7). In the game of futurology one is supposed to have some vectors to hand to indicate a general direction, particularly if it is of such importance. But there are no vectors in the history of science to support either Hawking's or Wilson's claim about the glorious outcomes of unifying knowledge. The one vector we do have is the accelerating proliferation of learning, which is the very trend causing anxiety.

We are asking: what is the effort to unify knowledge and why has it arisen; what would unified knowledge look like and yield as an outcome; and finally, how can we resist what looks like a takeover by science of the humanities?

Outsider Scholarship and Hierarchical knowledge structures

Most scholarship takes place within disciplines, or, perhaps more accurately, micro-disciplines. There is also much interdisciplinary work, and Nicolescu (2002, pp. 43-45) usefully distinguishes for us between multidisciplinary, interdisciplinary, and his proposed transdisciplinary form of scholarship. But what kind of scholar is likely to address the question of the integration or unification of *all* knowledge, given that they must live somehow beyond all the disciplines? Clearly the philosopher is engaged in this to some degree, but academic philosophy has increasingly specialised itself as the other disciplines have, and is increasingly interested in its own preoccupations. In general it falls to various kinds of free-lance or maverick thinkers to really pursue our question, and in recognition of Colin Wilson's *The Outsider*, it might be useful to call such thinkers 'outsider scholars'.

Colin Wilson published *The Outsider* in 1956 at the age of twenty-four. The book was an instant success, but this soured quickly as the political left were alienated by his obvious religious interests, and his second book was universally panned. What makes *The Outsider* so unusual is the extraordinary range of reading that

Wilson had undertaken to research it. This would be remarkable enough in one so young, but his gift as a scholar emerges in his capacity to *place* the reading. He had the critic's gift to take in a whole play, novel, painting – whatever – and in a few words place it in context, characterise it, and make its relevance to his thesis clear. Wilson achieved all of this with no university education, and with early marriage and family commitments forcing him to work at low-paid jobs. He was an outsider to any conventional form of scholarship.

The thesis of *The Outsider* does not concern us here, as Wilson was not interested in the theme of the unification of knowledge. But his outsider status and form of scholarship is one that is crucial to this question, and he points us to other twentieth-century thinkers who could be classed as 'outsider scholars', and who are directly interested in our question. These include, in order of birth date, Arthur Koestler, Douglas Harding, E. F. Schumacher, Robert Pirsig, and Ken Wilber.

Arthur Koestler was a Hungarian-born writer who, like Wilson, became the object of suspicion from the left. In this case it a number of books including *The Yogi and the Commissar* which set out an explicitly anti-communist stall. He didn't belong to the intellectual left any more, and his engineering studies in Vienna were likewise no basis for his broad intellectual searchings. He was an outsider to the university system, but attained perhaps the status of 'public intellectual' that Gore Vidal, Naom Chomsky and similar figures occupy. His relevance to our theme is his coinage of the 'holon', an entity that is a self-contained whole at one level in a hierarchy and at the same time a component of a greater whole. Koestler stands as a bridge between Renaissance ideas of hierarchical knowledge that found its peak of expression in Leibniz's *Monadology*, and the work of Ken Wilber.

Douglas Harding was a British architect and mystic, whose 'headless way' was a teaching system for enlightenment that never reached the mainstream. His first book *The Hierarchy of Heaven and Earth* (1952) was enthusiastically endorsed by C. S. Lewis, and set out a hierarchy of human knowledge that has occasional resemblance to Koestler's and Wilber's, though published decades earlier. He was an outsider scholar because, while he pursued his day-job as an architect, his broad reading in religion and science was untrammelled by the constraints of university research programmes.

E. F. Schumacher was an economist and protégé of Keynes, best known for his 1973 publication *Small is Beautiful*. It is in his last book however, *A Guide for the Perplexed*, that we see a mind at work on complete span of human knowledge and the construction of a hierarchical ordering of it. Like Harding he was not exactly an outsider as Colin Wilson defined it: both Schumacher and Harding were professionals in their chosen fields, and therefore insiders in that respect. But Schumacher's broad scholarship owed nothing to the university or convention, and, like Colin

Wilson, he seems to have the habit of *placing* material quickly and accurately. *A Guide for the Perplexed* was written, like Leibniz's *Monadology*, at the end of his life, and likewise probably summed up all this thinking.

Robert Pirsig is famous for his first novel *Zen and the Art of Motorcycle Maintenance: An Inquiry into Values*. He studied and taught at various universities, but rejected their assumptions and values, and eventually suffered a nervous breakdown. He fits most of Wilson's criteria for an outsider, and formal recognition was slow for his ideas. In 1974 however he was awarded a Guggenheim Fellowship for a follow-up novel, which became *Lila: An Inquiry into Morals*. Pirsig is greatly exercised in it over the fragmentation of knowledge, and his ideas will be explored shortly as the basis for an approach to knowledge integration.

Wilson was lucky with *The Outsider*: Victor Gollancz was the first publisher he sent it to, and was immediately accepted. Pirsig had one hundred and twenty-one rejections for *Zen and the Art of Motorcycle Maintenance* before it found a publisher. Ken Wilber's seminal book *The Spectrum of Consciousness* was rejected by more than twenty publishers before Quest Books took it on. Like Pirsig, Wilber trained in science, but was disillusioned with it, and subsequently developed his own broad-based scholarship with a particular interest in developmental psychology and Eastern mysticism. His own attempts to integrate knowledge almost define an industry, and culminated in his 2000 book *A Theory of Everything*.

We can now give a provisional definition of 'outsider' scholarship. From these few examples it is clear that outsider scholars operate mostly outside of academia. They pursue big-picture thinking which the specialist has not the time or perhaps inclination to do. Obviously they are extra-disciplinary, but less obvious is the often *anachronistic* nature of their thinking. By this I mean that they are not bound to the intellectual fashions of their period, and are readily inclined to rove across all historical periods and cultures. Because older thought-systems are often associated with the oppression intrinsic to feudalism, this makes the outsider scholar sometimes suspect to fashionable left-wing thought.

The outsider scholar must have the capacity to encounter a domain of thought or a cultural artefact and *place* it with precision, and with rapidity. This means an instinctive eye for quality, the eye of the critic. Otherwise they would soon drown. It is this that perhaps separates their thinking from that of the professional philosopher who generally tackles technical problems in philosophy, with little obligation to survey outside fields of study, let alone gain competence within them. So, if the outsider scholar is extra-disciplinary, pursues big-picture thinking, is anachronistic yet a gifted critic (which implies a sensitivity to the Zeitgeist), what term would properly encapsulate the opposite? I am going to suggest the term 'incremental scholarship' to stand in contrast to 'outsider scholarship'. Clearly, incremental schol-

arship is intra-disciplinary, and is additionally characterised thus: it is mostly cognisant of *recent* scholarship, makes small contributions to a collective effort, and is highly specialised. The Harvard referencing system has been perfected for this kind of scholarship: at a glance one can tell what other workers in the field are being drawn upon to reinforce an argument – or, more rarely – for refutation. The chief quality of incremental scholarship is that it generally fails to spot the larger picture even within its own discipline, and fails to get quickly to the essence of anything. That job therefore *must* fall to the outsider scholar.

The above writers as outsider scholars, with the exception of Wilson, are of interest because they propose hierarchical systems for the organising of knowledge. Before investigating this, it is useful to look at a non-hierarchical system used for taxonomising knowledge: the Dewey Decimal System. Here, just as a reminder, are its ten major divisions:

000 – Computer science, information & general works
100 – Philosophy and psychology
200 – Religion
300 – Social sciences
400 – Language
500 – Science (including mathematics)
600 – Technology
700 – Arts and recreation
800 – Literature
900 – History, geography, and biography

There is nothing hierarchical about this system, which is used in most libraries in the world. Of course, there is nothing to prevent certain hierarchies being proposed within one of the ten categories, for example it is common to hear: 'physics explains chemistry explains biology' as a hierarchy in the hard sciences. The ten Dewey subdivisions for science don't suggest this however. What Koestler, Schumacher, Wilber, Harding and Pirsig are sure of however that such a 'flat' approach to knowledge is wrong.

While Wilber's hierarchy owes much to Koestler, he tells us that he researched several hundred hierarchies out of which he developed his well known 'four quadrants' (Wilber, 1998, p. 63). Schumacher's 1977 work seems to owe nothing to Koestler's 1967 *The Ghost in the Machine*, where he introduces the 'holon', while Harding's scheme predates all of them. Pirsig's approach to the question is unique, in that he deliberately restricted his reading of other philosophers, and so draws on very little material that is otherwise common to those in this group.

The hierarchies of all of these writers firmly place them as outsiders because the mainstream has largely pursues the idea of a hierarchy defined solely in physical

terms. Schumacher, as unsatisfied as any in this group with conventional knowledge structures, or 'maps' as he calls them has this to say: 'The maps of *real* knowledge, designed for *real* life, did not show anything except things that allegedly could be proved to exist' (Schumacher, 1978, p. 11). He is complaining of an essentially positivist approach to knowledge, which requires the quantitative empirical proof of the hard sciences, and so makes maps leaving out all that is important to him: what he insists are 'higher things'.

The hierarchy in science, which builds from sub-atomic particles upwards, comprises the conventional view, and is unchallenged by the humanities. A. N. Wilson (1998, p. 81) is clear that this hierarchy is based on the scale of time and space. Harding and Wilber also use this as a starting point, but their cosmology of knowledge includes the spiritual as well as the material.

So far we have seen that the outsider scholar, as defined here, approaches the question of integrating knowledge from a hierarchical perspective. But does the hierarchy in some form or another really solve the problem? Crucially, does it achieve *integration*? To answer this, we look in more detail now at how knowledge is conventionally seen to fracture, and how Pirsig's particular hierarchy gives rise to an 'isthmus' theory of knowledge.

The Isthmus Theory of Knowledge Domains

If the Dewey decimal system taxonomises knowledge for the convenience of the librarian into ten major division, each with ten subdivisions and so on, then in the broader public sphere the initial division is just two-fold: between science and the humanities. This was highlighted in an influential lecture in 1959 by the British scientist and novelist C. P. Snow entitled 'The Two Cultures'. Since then the term 'The Two Cultures Debate' has encapsulated a set of positions on the division. Snow was exercised by the harm that the division would do in terms of effective government: if we live in a highly technological age, then what is the implication of having the administration run largely by humanities graduates with little understanding of science? Here he is on common ground with E. O. Wilson and Basarab Nicolescu.

Forty years later Melvyn Bragg wrote that the term was 'stapled to the English language' and that Bertrand Russell and John F. Kennedy were equally impressed with its significance (Bragg, 1999). Yet at the time the literary critic F. R. Leavis dismissed Snow as a 'public relations man' for science. Snow is an example of what I call the 'bi-literate' scientist, and in the intervening half-century there is evidence that such scientists are on the increase. But is literary awareness by scientists mirrored by scientific awareness in the humanities? Perhaps, but Leavis's criticism needs to be

taken seriously. Make no mistake he warned: science is attempting the colonisation of the humanities.

The campus novel *Thinks...* by David Lodge is a remarkable illustration of this situation. There is no doubt that *Thinks...* is a 'Two Cultures' novel because it pits male cognitive scientist Ralph Messenger against female creative writer Helen Reed. Their developing affair allows Lodge to examine the new claims of science to investigate consciousness, the field he believes to be traditionally the domain of the reflective arts such as literature. Helen resents Messenger's scientism: 'Hasn't science already appropriated enough of reality? Must it lay claim to the intangible invisible essential self as well?' (Lodge, 2001, p. 62) This is Lodge's basic assumption: that the 'intangible invisible essential self' is the 'province of the arts, especially literature, and most especially the novel.' Helen, representing the arts, is seduced and abandoned by Messenger, representing science. Lodge is clearly against the move by science to co-opt the arts, but the very attention he gives to the cognitive sciences strengthens their cultural reach. His novel, and also essays on the same subject suggest that cognitive science and neurology are the glittering snakes in whose glare the rabbits of art and poetry are, it seems, transfixed. His attempts at resistance are perhaps no more effective than Helen's. The relationship is asymmetrical.

The novel leaves us with the specific possibility: is brain science going to colonise the humanities? This is a serious issue. Basarab Nicolescu, in his manifesto of transdisciplinarity, states that one of its imperatives is the unity of knowledge, but also warns that 'any attempt to reduce reality to a single level governed by a single form of logic does not lie within the scope of transdiscplinarity' (Nicolescu, 2002, Article 2). So far so good, but he also says that transdisciplinarity demands of the exact science 'their dialogue and their reconciliation with the humanities and the social sciences, as well as with art, literature, poetry and spiritual experience' (Nicolescu, 2002, Article 5). Shouldn't alarm bells ring here? After all, isn't Lodge's novel a parable of how that 'reconciliation' may be firstly seduction, and then abandonment?

In Bragg's 1999 review of the Two Cultures debate he lists a series of bi-literate scientists, including Stephen Jay Gould. Gould is important to this discussion because of his book *Rocks of Ages* (2001), which this time is about the two cultures of science and religion. He puts forward the concept of 'Non-Overlapping Magisteria' (NOMA) to describe these domains, with the implication of entirely separate epistemologies and methodologies. The term 'magisterium' and its plural suggest domains distinct and worthy of respect, which is Gould's point. He is not arguing for any kind of integration or synthesis at all, rather the need, in the first instance, for both domains to be considered equal, separate, and answering different human needs. Unsurprisingly NOMA is disliked by a wide range of thinkers, both scientific

and religious. The atheist Sam Harris agrees with Richard Dawkins that NOMA is not an option, though he does not mention it by name. Harris (2006, p. 15) says: 'And yet, intellectuals as diverse as H. G. Wells, Albert Einstein, Carl Jung, Max Planck, Freeman Dyson, and Stephen Jay Gould have declared the war between reason and faith to be long over. On this view there is no need to have all of our beliefs about the universe cohere.' Harris talks about the kind of mentality that can maintain disparate systems of knowledge as 'partitioned'. Clearly, for Harris, knowledge must 'cohere', whatever that means exactly. Dawkins (2007, p. 78) is blunt: 'Gould carried the art of bending over backwards to positively supine lengths in one of his less admired books, *Rocks of Ages*.' Daniel Dennett (2007, p. 30) calls NOMA a 'political hypothesis', adding that Gould's proposal 'found little favour on either side' and that 'few readers were persuaded.' Dennett (2007, p. 71) later adds: 'the disciplinary isolation it creates has become a major obstacle to good scientific practice.'

Clearly, most scientists found Gould's idea of NOMA repulsive. But why? If there are two cultures as Snow lamented, then why not be realistic about it? The answer of course is that the glittering eyes of the snake of science are fixed on the rabbit of the humanities. It won't do to grant autonomy to a whole world of knowledge, beyond the reach of science. While amongst scientists there is talk of 'physics envy', amongst the bi-literate scientists it seems there is more than a hint of 'poetry envy'. Richard Dawkins (1998, p. 16) for example says that 'word for word, I wish I had written the following famous quatrain ...' referring to a passage from William Blake's poem *Auguries of Innocence*.

Ken Wilber is also not the sort of thinker to allow religion and science to be non-overlapping. On the contrary he seeks their marriage. Early in *The Marriage of Sense and Soul* (1998) he lists different ways in which science and religion are viewed, including a peaceful coexistence based on the 'Great Chain of Being'. This allowed for a hierarchy or nested structure of knowledge in which the higher domain – religion, spirituality or mysticism – enfolded the lower material orders, the study of which include the sciences. He calls this coexistence an 'epistemological pluralism', but claims that when modernity rejected the Great Chain of Being it also rejected epistemological pluralism (Wilber, 1998, p. 17). He says: 'All the past forms of epistemological pluralism *failed the test of modernity* because science itself did not and would not fundamentally doubt its own competence to reveal all important forms of truth.' (Wilber, 1998, p. 141) (His italics.)

In this quote we find an attitude that perhaps rules Wilber out from consideration as a true outsider scholar. An outsider would not say that epistemological pluralism failed the test of modernity, but that *modernity failed the test of epistemological pluralism*. Outsiders are not committed to the period in which they live. And the outsider has of course an ally here in postmodernism: it criticises modernity for

epistemological monism. Where Wilber is of course right is to say that science, or perhaps better scientism, believes that it has or will reveal all important forms of truth. His strategy is to offer modernity, i.e. science, a better position than 'low man on the totem pole' (Wilber, 1998, p. 24), the place it occupied in the Great Chain of Being of classical theory. Wilber believes, rightly, that science won't accept its relegation to a lower form of knowledge, and that by allowing science a role in all the levels of the Great Chain, it will somehow play ball. Wilber want science to be an equal partner in the realm of the senses, the realm of the arts, and the realm of religion, what he calls the 'Big Three'.

Wilber's 'four quadrants' apparently allows him to include scientific and spiritual hierarchies in a single scheme, thus retaining his epistemological pluralism while not offending science by placing it at the lowest level of a classical hierarchy. Here is his attempt to unite science and religion, but the question remains: what does 'unite' mean here? Perhaps it does achieve what Harris denies, that the two domains now 'cohere' – meaning stuck together. They have after all been stuck together on the page. But the doubt must surely remain: is this any more than a *taxonomisation* of knowledge domains? Worse, is this not a taxonomy designed to avoid offending science? In the term 'epistemological pluralism' Wilber seems to acknowledge a Gouldian NOMA, but then backs off very fast so as not to lose the cachet of 'scientific'.

Snow laments the reality of the two cultures, Gould celebrates different magisteria, and Wilber re-orders a hierarchical structure so as not to offend modernity and science. If Snow and Gould are bi-literate scientists, that makes them outsiders to some degree, at least to science, and their scholarship shows many such traits. But Pirsig can be considered as one of the purest cases of outsider scholarship. For a start he feels more like the outsider of Colin Wilson's description, one who is disenchanted with any establishment account of reality, and thus feels utterly alone. Yet the intensity of Pirsig's searching, particularly in *Lila* (1991), and the nature of his scholarship, yield a compelling and radical insight into the relationship between knowledge domains, which we can now turn to.

Pirsig naturally gravitates to a hierarchical account with four levels: Inorganic, Biological, Social and Intellectual, not in fact that far removed from Schumacher's four levels of mineral, plant, animal and man. But Pirsig not only demonstrates but carefully argues for another trait of outsider scholarship: the care taken *not* to read the 'authorities' on a subject, at least not before rigorously investigating it. Hence Pirsig's scheme owes nothing to any other hierarchical scheme, and is certainly no grand synthesis of them as Wilber claims for his quadrants.

Pirsig's real contribution is to make a tightly illustrated argument for the *separation* of levels within his hierarchy. This is not NOMA, because his higher levels enfold the

lower levels, as a hierarchy must. But the different levels operate independently of each other, sometimes in opposition, but always in ignorance of each other. Whatever values or goals our cells have, they are not the same as that of the human. Whatever values or goals a society of humans has, they are not coterminous with that of the individual. Schumacher (1978, p. 35) makes the same point when he says that there can be no 'links' or 'transitional forms' between the major stages of the hierarchy. But Pirsig shows what the nature of a legitimate link must be between any two knowledge domains. His best illustration of this comes from computer science, and the division between hardware and software. Pirsig muses on how the hardware or circuit designer learns nothing of programming, while the programmer doesn't generally even know how the bistable device – at the core of all computers – works. What connects these two 'cultures' is the tiny common ground of machine code instructions, a list so small you can write it on a single page. He calls this the 'isthmus' that joins these two levels of knowledge, but more importantly goes on to say that there is no direct interchange of meaning through this isthmus for the two communities. He takes this as the analogy for all separated knowledge domains when he concludes: 'Trying to explain social moral patterns in terms of inorganic chemistry is like trying to explain the plot of a word-processor novel in terms of the computer's electronics.' (Pirsig, 1991, pp. 179-182)

Pirsig and Schumacher are not embarrassed to relegate the physical sciences to a low level in the hierarchy. The explanations of the hard sciences are fine for the inorganic and to some extent for the biological, but the higher orders of social and intellectual are radically different worlds. Chemistry cannot explain a novel or a morality. However, Pirsig's isthmus is very interesting because it shows how a legitimate and very limited 'integration' of knowledge can come about or be tested for. For example, the social domain is a magisterium unto itself, but there has to be an isthmus – perhaps the DNA – out of which the higher domain arises from the lower one. Let us consider a few more such isthmuses.

In the relationship between physics and chemistry we can spot an obvious isthmus: the origins of the periodic table in the Schrödinger equation. Given that the nuclei of atoms are forged in the fusion reactors of stars, they then attract electrons equal in number to the protons in the nucleus. The Schrödinger equation then describes how these electrons settle into stable configurations, upon which all of chemistry rests. But in practice the Schrödinger equation is intractable for all but the smallest atoms, and three elements of the periodic table do not fit correctly. The isthmus is there, but in reality the two domains operate with rather different cultures. Chemistry remains a more taxonomical science than physics, while biology is more taxonomical still, and is also in large parts a descriptive science: the morphology of organisms having yielded little to reductive methods for example. We can say that even within the hard or exact sciences there are different cultures, different epistemologies and different methodologies.

But the search for isthmuses turns up interesting problems even *within* domains. In physics, the queen of the sciences, there is a domain-rupture which no isthmus has yet been found to bridge. As we saw earlier this is the gulf between quantum theory and relativity, hence the piquancy of the practical joke played by Sokal on the cultural studies community in his 'Hermeneutics of Quantum Gravity'. (His subsequent book, with Jean Bricmont, rather backfires as it shows that he has as little insight into the epistemologies and methodologies of cultural studies as cultural studies does of physics. The Two Cultures remain.) While Hawking may claim that string theory 'unites' quantum theory and relativity this claim is denied by others because the empirical studies have not yet confirmed the theory. It may even be that the construction costs of particle colliders required to carry out the investigation would amount to orders of magnitude more than humanity's projected maximum collective economic activity. The 'don't know' rules for the foreseeable future.

Turning back to possible isthmuses between physics and chemistry, we find not one but several: for example physical chemistry is an entire branch drawing heavily on thermodynamics, while isotopic chemistry relies on knowledge of the atomic nucleus. Similarly the isthmuses between chemistry and biology are numerous, and perhaps smeared out in a discipline such as biochemistry. The same is true for isthmuses between completely different domains such as science and fine art, or religion and fine art. Algorithmic computer art is an example I happen to have written about in detail, and I have also made a lengthy study of religion and film. In the first case the algorithm is the common ground between the computer artist such as Roman Verostko, John Whitney Snr. or Jean-Pierre Hérbert, and the computer scientist such as John von Neumann (King, 2002). For the artist the algorithm has morphological meaning; for the scientist it has formal meaning in the abstract realm of a universal computer programming language. In the case of religion and film the script is the isthmus between them. For the religionist the script carries religious or spiritual meaning, adumbrated through human drama, while for the director the script is a key part of the blueprint for a dramatic work of art. A good example would be Bresson's *Diary of a Country Priest* (1951), where the cinematic artwork is a fine example of Bresson's spare style, and which happens almost accidentally to convey some of the deepest truths of the Christian concept of grace. The film is highly regarded by most writers on religion and film, who at the same time are mostly agreed that the interdiscipline, as they call it, is at the meeting of two worlds that are *sui generis*: neither begets the other.

Ever since Fritjov Capra's seminal *Tao of Physics* was published in 1975 a veritable industry has been spawned commending quantum theory as the bridge between science and religion, or science and consciousness. It is effectively the physics-proves-mysticism thesis. This idea is now an orthodoxy of the New Age, but Wilber was a lone voice publishing a book called *Quantum Questions* (1985) that chal-

lenged this view. All credit to him. But how would isthmus theory, as I have developed it so far, cast light on this issue? Pirsig's original isthmus, the single page of machine code instructions, links two domains, as we saw. But would the higher domain, the software, fall apart if the machine code isthmus was not there to connect it to the lower domain, the hardware? The answer is yes. In the example of chemistry, would it fall apart if there were no electrons with stable configurations described by the Schroedinger equation? The answer is yes. Would algorithmic computer art disappear without the algorithm? Obviously. Would religious films disappear without the script? Obviously – or at least all that might be left would be Dogme 95-style improvised ramblings.

But would consciousness or religion disappear without the fundamental particles described by quantum theory? The answer now is not clear cut. On a hierarchical model, whether Wilber's, Koestler's, Shumacher's or Pirsig's there is a chain upwards from the inorganic level all the way to consciousness, or intellect, or mind. So, without an inorganic substrate on this model, nothing higher can exist, true. But is quantum theory the legitimate *isthmus* that takes us to consciousness or the realm of religious experience? In Pirsig's example there is a natural bridge or isthmus between two realms, because both communities are intimately bound up with it, even if, as he says, it means different things to the two communities. Machine code is common to both. But quantum theory is not like that for science and religion: only one community is bound up with it, and it means something to only one of the two communities. It is not common to both. The continents are on other sides of the world. When the (largely) New Age communities claim quantum theory as the isthmus between science and spirituality we can see this as merely the harmless adoption of a metaphor: for example Dana Zohar's 'quantum hussy' – who could bilocate and therefore have an undetected affair – is amusing enough. But isn't this use of quantum theory more like a Trojan horse, an infiltration of science into domains where it does not belong?

Many people have been impressed by Einstein's dictum: 'Science without religion is lame, religion without science is blind.' (Einstein, 1988, p. 46) I disagree with it: science without religion is what enables science to run so fast (just think of Galileo), while religion without science is what enables religion to see so far. The attempted integration of the two would yield a blind cripple, not a far-sighted sprinter. Adopting the methodologies and epistemologies of the one would ruin the other. They are non-overlapping magisteria. But why does the dictum appeal? Perhaps we don't read it literally like I have done here, but accept that an individual needs to pursue both science and religion to lead a balanced life. Even that is dubious though, if one accepts that religion – at least in the sense that Colin Wilson, Wilber, Koestler, Shumacher or Pirsig understand it – is at a higher level on the hierarchy. In this mode of thought the higher contains the lower, but not the other way round. In crossing a major division in the hierarchy, there are no links or transitional forms

as indicated by Schumacher, or isthmuses as indicated by Pirsig. When a higher order enfolds a series of lower orders there is a kind of minimum integration offered by the specific proposed taxonomy. *Intellectually*, we can roam across the orders, though even this requires proper rigour, as isthmus theory shows. But when faced by what is a mounting take-over bid for the humanities by the sciences, we will discover that the issue is what level of organisation do humans exist at, *experientially*?

Before looking at this question, and before examining Wilson's consilience as the paradigmatic take-over bid for the humanities by the sciences, let us recap a little. We are taking a radical look at the field of 'integration' in the fields of human knowledge, against a background perception that the fragmentation of knowledge makes it hard to meet the challenge of contemporary life. While it is clear that this 'integration' might be better understood as the taxonomisation of knowledge domains, it does seem that 'outsider' scholars have contributed greatly to important taxonomies that go beyond the Dewey flatland. The isthmus theory deriving from Pirsig helps us discover real contiguities between knowledge domains. When attempting to solve problems it is clearly useful to be able to reach to a discipline which has one or more genuine isthmuses to the problem domain. Without a proper isthmus one is simply reaching for metaphors, which may be useful of course, but tell us nothing about the real integration of knowledge. Beyond these rather practical issues there does seem another force at work however: the idea that the 'integration' of all knowledge will somehow yield a mystical breakthrough. This is just a misplaced mysticism, an understandable human longing, but irrelevant to the question of knowledge domains. Unfortunately it seems to cover up, or even drive, a much more regrettable process: the colonisation of the humanities by the sciences in the name of integration.

To make a Toyota car one needs all the Toyota parts for that model. Parts for a different make or model will not, generally, fit. The parts that do properly belong to that car are *integrated* into a whole in the assembly process, and have no utility, generally, outside that particular whole. Can all of knowledge be integrated in the same way, into a whole? Do we have a name for the entity so constructed? The answer, bafflingly, seems no. All the models of knowledge, whether flat or hierarchical, which claim to properly relate all knowledge domains, cannot somehow assemble an entity from the parts, which is then a whole, like the Toyota car. The term integration means to 'make one', and in the case of the car, it means that all the parts fit together correctly, and that the new entity correctly functions as a higher-order entity of that type – a car. But we don't have an entity of any type that could be the sum total of all knowledge, and if we did, we would stand round it and wonder what it was for. The search for union in mysticism, and the 'whole' that is its goal, are nothing like this quest for the integration of knowledge.

The quantum-theory-proves-mysticism community is largely New Age, and so quantum theory as an isthmus between science and religion is not part of the mainstream. However the idea that neuroscience can bridge the Two Cultures divide is more commonly found. 'Neuro-' as a suffix is now being found in microdisciplines as far apart as neuro-aesthetics and neuro-theology, suggesting that neuroscience is set to be the grand isthmus to bridge the two cultures of science and everything else. But, just as with quantum theory and religion, we note that this apparent isthmus is not like Pirsig's: it is not in the first instance shared between the two communities, not even if we grant it radically different meanings in them. Only one community is bound up with it and finds meaning in it beyond mere metaphor: science. Could the alleged isthmus here be no natural joining of continents, but in fact the bridgehead for an attempted takeover?

What isthmus theory would suggest in this scenario is that knowledge domains are not like car parts, designed to fit together to make a whole of a higher order. It suggests instead that domains can be taxonomised into a hierarchical structure, but that for one domain to have kinship with another requires a common isthmus. An isthmus joining domains further down the chain has no relevance for domains higher up, and a proposed isthmus may be no more than a take-over bid in disguise, if it is not truly common to both domains. Isthmus theory does not provide for the unification of all knowledge domains, but examines *kinships* or *contiguities* between domains that remain far more separate than connected.

But what of those who insist, in intellectual acts of the most daring futurology, that the unification of all knowledge is possible and will give rise to a glorious new entity? We have encountered thinkers who certainly believe this but are rather vague about the teleology of it. And we only have to turn to religious thinkers like Teilhard De Chardin and Sri Aurobindo, and scientific thinkers like Frank Tipler and Ray Kurzweil to discover visions of this final union, and names for the ultimate entity. De Chardin came up with the term Omega Point, also taken up by Frank Tipler. Aurobindo uses 'Supermind', while Kurzweil uses 'Singularity.' There is no doubt that the works of these thinkers is inspirational to many, but the truth remains that the discovery of any trajectory that proves these outcomes is yet to come. What persuades them all, of course, is the accelerating nature of human knowledge discovery. However an acceleration proves no asymptote, and certainly cannot disprove a later deceleration. The jury *has* to be out on these assumptions. As yet there is no plausible entity that would be the ultimate integration of all knowledge.

In the meantime, however, as the world's knowledge communities wait for the holy grail of the unified field theory in physics and a convincing 'theory of everything' across the remaining knowledge domains, a danger grows. Along the road to 'integration' the very effort is creating a huge opportunity for science to make a takeover bid for other knowledge domains. In the name of integration scientism – and

its philosophical basis in Logical Positivism – is encroaching on knowledge domains where it has no business. The 'consilience' of biologist E. O. Wilson is a good example.

Against Consilience

In Richard Feynman's autobiographical work *Surely You're Joking Mr Feynman* (1988) he tells us how he made a deal with a painter friend to trade expertise. Feynman learned painting while the painter learned quantum theory. However the mutuality of it was lost when the painter gave up on the physics after a period, where Feynman continued to paint and exhibit his work in galleries long after. It is the same lost mutuality between the protagonists in Lodge's novel. This proves one thing: it is easier for a scientist to apparently master the humanities or an aspect of it than vice versa. We saw that Bragg's 1999 article included Gould among scientists literate in the humanities. He also cited Dawkins, Hawking, Penrose, Pinker, and Greenfield admiringly but wondered if it was not just a passing fashion: what I am calling the bi-literate scientist. More than ten years on my conclusion is that the phenomenon is here to stay, partly bolstered by the aftermath of 9/11.

In the rush to examine religious fundamentalism there emerged what is now called the 'new atheist' – highly literate scientists like Dawkins, who received fresh impetus to furiously research religion and the humanities. In turn these provoked what I have called the 'new defenders of faith', who are bi-literate humanists. They in turn have been furiously researching science. (For a detailed account of this see Part Two of my book *Postsecularism: The Hidden Challenge to Extremism*.) Schumacher (1978, p. 13) cites Victor Frankl for us on this subject: 'What we have to deplore therefore is not so much the fact that scientists are specialising, but rather the fact that specialists are generalising.' The fact that Feynman took up painting is one thing, simply a second specialism, but what the bi-literate scientists are now doing is to generalise from their scientific specialism. They pontificate on all possible subjects and, as Bragg shows, they are well received. Dawkins for example was voted Britain's top intellectual by Prospect magazine in 2005, coming third on the world stage after Noam Chomsky and Umberto Eco.

It is the bi-literate scientists who are threatening a unification of all knowledge as *science*, and E. O. Wilson is amongst the most persuasive of them in his book *Consilience: The Unity of Knowledge*.

Wilson sums up his project as follows: 'The central idea of the consilience world view is that all tangible phenomena, from the birth of stars to the workings of social institutions, are based on material processes that are ultimately reducible, however long and tortuous the sequences, to the laws of physics.' (Wilson, 1998, p. 266)

This would be laughable for Pirsig. As he shows, there may be isthmuses all the way up on the journey from quarks to social institutions, but each isthmus is also a kind of meaning exchange: the inhabitants of the domains may interpret the narrow common ground that connects them quite differently. For Pirsig, to jump from quarks all the way up the chain to the moral questions of society is to abandon all hope of meaning, or in his terms, *quality*. Schumacher also disposes of Wilson's proposition in the most elegant of terms, and so do all the outsider scholars we have mentioned.

So why take Wilson seriously? Because of Lodge, not Pirsig. Lodge's campus novel *Thinks...* is that of the literary insider who finds rather delicious the novel terrain of cognitive science, perceives perhaps some kind of threat in it, but is ultimately not disturbed. Pirsig, as the outsider, does not have to take on the assumptions of any discipline, and hence can see clearly the absurdity of attempting to explain such a thing as consciousness in terms of quarks. But Lodge as the insider represents the mainstream, and in his parable of the take-over bid from science the feminine principle of the humanities, particularly the creative arts, is overwhelmed by the masculine principle of the sciences. Lodge's defence is simply inadequate against the onslaught typified by Wilson's consilience.

We have seen that Wilson justifies his mission as follows: 'When we have unified enough certain knowledge, we will understand who we are and why we are here.' Elsewhere he says: 'The greatest enterprise of the mind has always been and always will be the attempted linkage of the sciences and humanities' (Wilson, 1998, p. 8). Wilson acknowledges the importance of Dawkins' memes in his programme for the unification of science and culture. He understands the meme to be the 'unit of culture' and wants it to stand at the base of semiotics, which in turn he considers to be at the basis of a scientific explanation of culture. He says he wants 'to establish the plausibility of the central programme of consilience, in this instance the causal connections between semiotics and biology.' (Wilson, 1998, p. 136) Wilson has a hierarchy: quarks at the bottom, working up the scale of size and complexity to biology, then a leap to semiotics, and from there to mental processes. He says: 'Belief in the intrinsic unity of knowledge rides ultimately on the hypothesis that every mental process has a physical grounding and is consistent with natural science.' (Wilson, 1998, p. 96)

Wilson's programme is not that different to Dawkins' or Dennett's, but is on a grander scale, and is specific about the attack on the social sciences, economics, the arts, and religion. For each of them he has a bridgehead, or alleged isthmus.
Wilson does make the valuable point that consilience within the social sciences is nowhere near as pronounced as in the exact sciences. What is more there is a gulf between them: he laments how little the social sciences draw on the hard sciences. However the thinks that is changing with the recent advances in science, and pro-

poses four 'bridges' across the divide: brain science, human behavioural genetics, evolutionary biology and the environmental sciences (Wilson, 1998, p. 192). His 'bridges' are of course proposed isthmuses, and we will gradually focus down on brain science as the key 'bridgehead' of his assault. Welcome to the world of neuro-everything.

Genetics in one form of other is of course the preferred bridgehead for Dawkins, Dennett, Crick and other biological materialists, though the gene itself has morphed into the meme in order to carry through the attack. Evolutionary biology, if it gains ground in the social sciences, will be persuasive to some simply because of the enormous cachet given to the word 'evolutionary': it has come to mean progressive. In turn the environmental sciences seem a good candidate for a field where the integration of knowledge is progressing apace. In reality however environmental science is an interdisciplinary branch of the natural sciences, and as such will always fails to capture Pirsig's 'quality': it offers *analysis* but no *synthesis*, and even Wilson inadvertently proves this, as we shall see shortly.

On another subject Wilson says: 'The enterprise within the social sciences best poised to bridge the gap to the natural sciences, the one that most resembles them in style and self-confidence is economics.' (Wilson, 1998, p. 195) In fact Wilson is least convincing here, particularly after the so-called Credit Crunch of 2008-2010. Even without this economics as a 'science' has had a predictive power so low as to make it a laggard even in the relatively undemanding domain of the social sciences. Wilson is conscious of the contrast made between science as an activity of analysis – breaking down into parts, and that of the arts as a creative act. He admits that while science 'advances by reducing phenomenon to their working elements', he is adamant that it 'does not aim to diminish the integrity of the whole.' We now come to his important statement on synthesis which then follows: 'On the contrary, synthesis of the elements to re-create their original assembly is the other half of scientific procedure. *In fact it is the ultimate goal of science*.' (Wilson, 1998, p. 211) (My italics.)

If so, then Frankenstein.

In fact the goal of the hard sciences has never been, and never will be, 'synthesis'. If there is a domain where the 'working elements' are built into larger structures, it is engineering. It is true of course that the engineer often needs to draw on a wide variety of scientific knowledge – in addition to the craft of that particular branch of engineering – but this does not represent a synthesis of knowledge, merely the skilful application of it. And the unskilful application potentially leads to horrors such as Frankenstein, and social engineering experiments such as eugenics and forced migrations.

In fact, Wilson does not suggest that synthesis is the isthmus between science and the arts: instead, it is *interpretation*. It seems that for Wilson, criticism will have attained legitimacy when it is based, ultimately, in physics. He says: 'Interpretation is the logical channel of consilient explanation between science and the arts.' (Wilson, 1998, p. 211) It is significant then, that the outsider, so gifted in criticism, is the one who rejects such consilience.

Here Wilson has fallen into a common trap for scientists: he understands all knowledge domains as predicated on *explanation*. The sciences are successful to the degree of their explanatory and predictive powers – which is why, on either count, economics cannot be classed as an exact science. But the arts are successful for quite different reasons, and criticism or interpretation in this field is likewise not successful as explanation, but as exegesis perhaps, or as polemic, or even as an art in its own right.

On religion Wilson has this to say: 'The eventual result of the competition between the two world views, I believe, will be the secularisation of the human epic and of religion itself.' (Wilson, 1998, p. 265) Here Wilson has lost patience it seems with the project of unification: religion is a 'knowledge' too far for him, and deserves only secularisation. He fails to find any isthmus here, however implausible. (Instead we have to rely on Dennett (2007), who is cheerfully convinced that memes will come to the rescue.)

Wilson's take-over bid is consistent with those mounted by Dawkins and Dennett, and attempted in countless small thrusts from bi-literate scientists and others who, even if not trained in the sciences, believe in its domination. We have seen that Wilson is systematic in a way that others probably are not, in that he constructs isthmuses or variants of his strategy for each of the domains of the social sciences, economics, the arts and religion, though the last will simply be swept away. The integration of all knowledge, its 'unity' as he prefers, is this: to be reframed as science, science and more science.

The outsider scholar, armed with various hierarchies, and a consideration of the isthmus as a legitimate but narrow bridging idea between knowledge domains, resists consilience. In contradiction to Wilber the outsider scholar is not afraid of offending science or modernity in placing science at the bottom of a hierarchy of understanding, and sternly resisting its upwards and usurping climb.

But how exactly? How is the take-over bid of consilience to be resisted? I suggest with the confidence that Wilson's supposed isthmuses are going to let him down.
We have already hinted at the weakness of some of them, but we can start by properly disposing of *synthesis* as any kind of isthmus. Although he uses 'interpretation' as his bridge from science to the arts, it is the discussion of the arts that

prompted him to declare that the goal of science is synthesis, as mentioned above. Yet if this were so, the environmental sciences would be able to construct ecosystems, for example. The analysis of all the parts of an ecosystem gives proper scientific knowledge about the interaction of living things, so why should a synthesis not be able to put together novel ecosystems with existing organisms? This does not sound too ambitious perhaps, no hint yet of attempting to make a living organism from inorganic components. Wilson himself describes the most ambitious attempt yet to build an ecosystem, Biosphere 2, as 'not a failure' despite the collapse of the artificial ecosystem within it and the extremes of physical and emotional discomfort experienced by its inhabitants. But even he concludes: 'The living world is too complicated to be kept as a garden on a planet that has become converted into an artificial space capsule.' (Wilson, 1998, p. 280)

On this basis Wilson very rightly gives up on synthesis, as he also does, for example when he muses that the 3D structure of a protein cannot be predicted from a knowledge of its atoms (Wilson, 1998, p. 83). Pirsig is way ahead of him on the impossibility of predicting anything substantive about a higher-order world from its lower-order constituents. This leaves Wilson's other 'big bridges': brain science, human behavioural genetics, and evolutionary biology. These are really just two: neuroscience and genetics, of which the latter can be challenged more easily. For Wilson, Dennett and Dawkins, the gene is the key to biological life, but poses a problem for their take-over bid: it works too slowly to account for changes in human culture, the very bit they are staring at longingly with those glittering snake-eyes. Hence the gene has become the meme. This, being a non-material entity, is not a proper object of science, so the necessary step is to imagine the neuroscience of the meme, or to put it another way, its neural correlate.

So, as suggested earlier, it all boils down to the brain, or in other terms, neuro-everything. Here is the grand proposed isthmus of the take-over: the brain science that says the brain is material, and is built from quarks upwards. However, the mind, which is at the pinnacle of the hierarchy, must be somehow winched down into brain. Perhaps the best expression of this ambition comes from the neuroscientist Antonio Damasio:

> From my perspective, it is just that soul and spirit, with all their dignity and human scale, are now complex and unique states of an organism. . . . And this is of course the difficult job, is it not: to move the spirit from its nowhere pedestal to a somewhere place... (Damasio, 1996, p. 252)

I have called the whole attempt to move mind from its 'nowhere pedestal' into the brain 'Damasio's error' (King, 2007, p. 257), and am not alone apparently. What brain science does is to make correlations between mental content and brain state, and is increasingly successful in doing so. The crucial question here is as follows: *is*

a correlation a legitimate isthmus between knowledge domains? Is the neural correlate a sufficient reason, not so much to winch down mind into brain, but to winch up biological science into contact with mind? Does it convince, like the machine code as the isthmus between hardware and software, the Schroedinger equation as the isthmus between physics and chemistry, the algorithm as the isthmus between computer science and computer art, and the script between religion and film?

I argue no. A correlation isn't good enough. There has to be a common ground between two domains that explorers of both can meet at. No philosopher, mystic, novelist, poet or psychologist will ever encounter 'synapse' or any other term belonging to brain science in their investigations of mind. And no brain scientist will ever encounter consciousness in the brain. The isthmus simply isn't there. They are non-overlapping magisteria, simply because human experience operates at a certain order of description. As Pirsig or Harding say the human is not the quark, atom, cell, organ, society, planet, galaxy or universe: human experience is human. Perhaps cells and galaxies feel, know and experience, but that must remain pure speculation, because they belong to different orders.

Consilience, then, is a plan to unify all knowledge as science, and its outcome is mind-brain identity. More broadly it represents a take-over of all the humanities by science, and as such should be resisted. Before considering the shape of that resistance, it is worth briefly considering why science has the exalted place it does in contemporary culture. In the first instance, clearly, its predictive power, and the technologies that ride on that predictive power, give us immense physical freedoms from drudgery, pain, boredom and even oppression, as richer societies can afford welfare, human rights and so on. But its utility alone cannot explain the fascination we have for it. It is also *beautiful*.

It is this more than anything else that is so breathlessly present in the works of the bi-literate scientists: they are aching to share the beauty of science with us. Now, Max Weber used the interesting term 'musical to religion' to describe what he personally lacked: a feel for the lived religious life. One can extend this expression to any field: one can be musical or musical to anything, and that includes science. Those in the humanities who are inspired by science writing, including Melvyn Bragg, are clearly musical to science. Many are not, but they remain silent. It is unfashionable to say with Yeats that science is the 'opium of the suburbs'.

But the beauty of science should be placed in perspective. No one denies that the good life for an individual might variously include a fine wine, a rare cheese, a new chess opening, a murder mystery, a visit to an exhibition of modern art, or the appreciation of architecture. Or music or religion. Science as an aesthetic experience can be included in these pursuits as expansive of the human sensibility, just like

the others, and a writer like Richard Dawkins can be a magnificent expositor of it. But to give it priority where it insists that the fine wine, rare cheese, painting or whatever *are states of the brain* is to allow it as one aesthetic to dominate and *de-aestheticise* other experiences. Science should take its turn alongside the cheese-board, for those musical to it. And as to its utility, sure: if one's brain goes wrong, let's have the mechanic in.

Hence the first form of resistance to science is to recognise that utility is utility, and that any one aesthetic pleasure has no right to lord it over another. But I am going to offer a more active form of resistance: to actively fight brain, neuron, synapse, peptide and the whole caboodle. It is instructive to start with Aristotle, who thought that the brain was an organ for cooling the blood, in carrying out which function it also produced snot. In the Middle Ages only the latter function was attributed to the brain. It seems that the most subtle of intellects have no particular reason for associating mind with brain. However, the issue is not as laughable as Aristotle unfortunately made it. In the exact sciences term like 'brain', 'neuron', 'synapse', 'peptide' and so on do not refer so much to things as to processes. The brain, out of this collection, is large enough to see with the naked eye, but its functioning is a matter of inference. Things that cannot be seen are totally a matter of inference, not at just one remove, but often down a long chain. The electron for example is made known to science through a long inferential chain which starts with experimental phenomena like the photoelectric effect or observations of the gold-leaf electroscope.

When we see red, brain science tells us that signals pass along the optic nerve into the visual cortex, and various neurons fire up. Once we have a full description of the pattern of neuronal activity we will have the 'neural correlate' of red, allegedly. But the neuron as a concept is a composite of its form as revealed in a microscope, and the function ascribed to it, involving electrons, and arrives at our understanding by not just one inferential chain, but a series of interlinked ones. Now here is the point of this discussion: 'red' is a direct experience, but 'neuron' is a construct – albeit maybe a true one – that is present in our experience only as the mental rehearsal of a complex inferential chain. There is no direct experience of neuron. Or for that matter, brain, synapse, peptide and so on. Red exists as a direct experience and also as a construct (for example I can rehearse its place in the electromagnetic spectrum and the sensitivity of certain receptors to its wavelength), but neuron and electron exist *only* as construct. There may be neural correlates to the experience of red, but *there is no experiential correlate to* 'brain', 'neuron', 'synapse', 'peptide' and so on. Aristotle had no reason at all to think that the brain was the seat of mind – let alone posit the absurdity of mind-brain identity – because there was nothing in his immediate experience corresponding to 'brain'. Maybe neurons experience other neurons; maybe distant galaxies experience other distant galaxies. But human experience is on a human scale and at a human

organisational level: for all else only inference remains, and inference cannot replace experience.

Here is the arrogance of science as uttered by Wilson: 'Without the instruments and accumulated knowledge of the natural sciences – physics, chemistry, and biology – humans are trapped in a cognitive prison.' (Wilson, 1998, p. 45) On the contrary, I assert, science traps humans in an inferential prison, where they are so busy rehearsing inferential chains that they neglect immediate experience. The blackbird sings on the window ledge, a jazz line rendered in an improbable melodic baritone, but the scientist, wants us, not to experience this directly, but to rehearse with him or her such things as the audio spectrum, sympathetic vibrations, neural transmission, auditory centres and a total brain activity more complex than the workings of a nuclear power station. In the meantime the bird is gone. So is life. To put it simply, what really matters to us are not the things that entail long inferential chains, but the things for which there are experiential correlates. Red, pain, and the blackbird's song matter, long explanations don't, except for utility, and for the fun of it if you are so inclined. If you are more musical to the long inferential chains of science than you are to the blackbird, or the cheeseboard, fine. Just don't foist your hobby on me as an ultimate truth.

Conclusions

The question of the integration of all knowledge is an important one of our times. In this investigation I have started with a certain scepticism that one cannot unify knowledge, only taxonomise it. However, in looking at some hierarchical schemes for taxonomising knowledge as elaborated on by various 'outsider' scholars there is much at stake, beyond the mere selection of the best possible taxonomy. Of particular value is the 'isthmus' concept as offered by Pirsig, as a way of discovering whether any two knowledge domains can be legitimately related to each other, and thus in some limited way 'integrated'. It turns out that isthmus theory also becomes valuable in countering attempts by scientists to integrate knowledge which are often nothing more than a take-over bid for the humanities by science. In arguing against one of the most sophisticated such attempts – the 'consilience' of biologist E. O. Wilson – we discover that his proposed isthmuses are bogus, and are more like military bridgeheads or Trojan horses. The chief of these is the attempted insertion of brain science into every aspect of the humanities, based on the argument of the 'neural correlates'. An opposing argument is developed here to turn the scientists' move against them: that of examining concepts for their 'experiential correlates'. It turns out that 'brain', 'neuron', 'synapse', 'peptide' are not objects in our direct experience. They have no experiential correlates and hence cannot be ranked with the objects of the humanities which do. The objects of science mostly remain products of lengthy inferential chains, and, while their rehearsal has utility,

and even, for the right kind of mind, beauty, the single-minded pursuit of these rehearsals would be the death of all experience.

However the energy that drives the integration of knowledge has a source beyond mere utility, or a rarefied kind of intellectual aesthetics: it also derives from a misplaced mystical impulse for unity. It is misplaced because the analytic mode of thought of the sciences has no synthetic counterpart: one cannot find mystical union by first dissecting the whole into parts, and then re-assembling the parts into a whole. The mystical status for this misplaced search for the union of all knowledge is perhaps why few convincing arguments have so far been assembled against the takeover bid by the sciences of the humanities. I hope that the ideas presented here provide some grounds for serious opposition to this attempted colonisation in the name of integration.

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