

Our textual future

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The new digital textual medium is elbowing the book out of its familiar place in our culture while soliciting general acceptance of itself in its own right. Two major questions insist themselves. The first is: if text does manage to hold its own as a means of communication, how will the paper book and the new digital textual medium cohabit? Will the book continue to serve as the most efficient reading machine for the many purposes it now serves—at least for the foreseeable future—or will digital reading machines take over from the book? The second is a more fundamental question: in the increasingly mediated future, what may be the continued role of text? As other communicational modalities, both existing ones and ones yet to be devised, continue to make inroads into the field of text,

may not text lose its important position in human communication? Before I'll recklessly attempt to answer these questions, let's investigate the situation our culture finds itself in and come to grips with how this situation has come about.

Transformations in medium use have been going on for centuries, but towards the end of the 19th century their speed began to accelerate dramatically. Since that time, the number of mediums has grown rapidly, and so, in consequence, has the importance of mediums to society. As film, radio, and television in turn carved out prominent positions for themselves, the relative importance of text in the medium spectrum diminished accordingly. The situation will continue to change rapidly, but at this time we can be confident that we are still liv-

ing in the Order of the Book. The book, in its material form and in its institutionalized social role, represents a particular way of regarding the world. Its material form makes the book an instrument that naturally favours the creation of lasting records of human thought, and that naturally imposes a hierarchical and linear order on those records. Books are self-contained, unchangeable, authoritative: monuments of achievement. By extension, in a literate society like ours, an education system based on books favours a hierarchical, orderly, and linear way of thinking. In this manner the Order of the Book strongly influences—even determines—our way of conceptualizing the world.

Discontinuity between print and the digital textual medium

The digital textual medium, by contrast, constitutes a more level form of cultural transmission: democratic, fluid, tending towards disorder, consisting of endless chunks of textual matter, connected actively and deliberately through links, and passively and potentially through search queries, allowing endless permutations and re-combinations. Moreover, these text chunks also find themselves in the company of chunks of other modalities, in equally rich variety and quantities. The well-governed and orderly textual world in which everything has its place is then being confronted by a docuverse of text and other modalities that is decidedly disorderly, even anarchic. In this universe, texts behave in ways never before encountered, defying our attempts at control—at least when we apply control methods familiar from the Order of the Book.

That digital texts may be collections of ones and zeroes residing on a disk instead of being a pile of paper; that such a disk may be accessed from anywhere in the world now that it is connected to the digital network; that those texts remain in a permanent state of flux: the implications of the new, virtual nature of text are only just beginning to become clear. The docuverse is characterized by mushrooming quantity, but also by lack of recognizable standards to judge quality, and by impermanence. It is intensely connected and truly global, but also highly fragmented. The written texts that used to be read in dedicated concentration and silent union between writer and reader, separate from any engagement with other mediums, are now moving into

a larger medial universe where they compete with all the other texts clamouring for attention. What is more, those competing texts are no longer content to lie waiting patiently until a curious human deigns to turn enquiring eyes to them, but they insinuate themselves continuously, through inviting hyperlinks, through trawling searches, and even through dancing icons and beeping alerts, and active RSS feeds.

The absence of entrance barriers in this heterogeneous docuverse has thoroughly democratized the means of textual production and dissemination. Anyone may publish anything, of any quality or quantity, subject only to legal restrictions—and even these tend to be easily circumvented. When the need to select—which dominates conventional book production—falls away, writers and other information providers don't have to limit the extent or nature of the materials they publish in any way. Think of the way analogue photos involve film that needs to be developed, with prints made at a certain cost per photo. Compare that with taking digital photos, at virtually no actual cost, in quantities limited only by the capacity of storage memory, whose cost keeps dropping steadily.

The way these digital texts are consumed is very different, too. Once networked, their full text can be searched as a body. This new form of access replaces the identification, location, and searching of relevant texts through the conventional bibliographical mechanisms that reigned in the world of print and imposed a hierarchical order on them. It brings novel ways of finding, promoting serendipity, but it also stimulates a sampling and zapping manner of reading. This way of consuming text is not unlike the way image and sound are consumed in today's world of multi-channel television and the seas of 'songs' that have replaced the 'albums' of yore. The search algorithms employed by various search engines may order their results in any number of ways, but whatever the order may be, those results will in no way resemble the outcome of conventional analogue searching, using card catalogues, indexes, footnotes, and the browsing of physical books. Where the use of consciously designed hyperlinks is still vaguely reminiscent of the print practice of footnoting, search engines offer an entirely new experience, for which no ready parallel presents itself in the Order of the Book.

As a result of the lack of restraint on publication im-

posed by the digital medium, the tendency is clearly towards the provision of ever more data, including notably also more raw, unpolished materials. The cheapness of disk space and the absence of entry barriers mean that anyone may place anything on line. The fact that something is 'published' on the Web says nothing about its status in the range between what in the Order of the Book would be called, say, source, note, draft, or polished final product. Moreover, not all final products will be polished and bear the seal of a publisher, library, or other organization that may be trusted to have applied certain known or inferable selection criteria to it. It is then left to readers to sift through the vast mass of materials available in the digital document space with the help of any devices they can muster. The use of search engines or portals to *locate* resources is the easy part. The challenge begins when it comes to judging the status and quality of the material found. In the Order of the Book the distinction between materials 'touched' by the instruments of the actors inside the traditional knowledge system and those not so privileged always used to be a vital one. In the digital arena, the distinction is harder to make (especially as the number of participants grows) but is also more relevant. Here, the familiar bibliographic aids must be supplemented by new ones, such as collective tagging, user commenting, or aggregating services. Ultimately the onus is on the individual, not just as a passive consumer, but also as an interpreter, for himself and others, of the nature and status of the texts he encounters and consumes.

Continuity between print and the digital textual medium

Though there is considerable discontinuity between print and the digital textual medium, there is undeniably continuity as well. The publication in a digital form of texts, which used to be published and distributed as, say, printed journals or books, surely constitutes an obvious case in point. Moving the contents of the *Encyclopaedia Britannica* online has perhaps changed how it may be used, but it did not fundamentally change the text itself. The resulting digital publication remains what it always was: an encyclopedia under strict editorial design and control whose contents are widely regarded as trustworthy. Books increasingly have a hybrid existence on paper and as a digital file for download as, for example, the titles Amazon.com offer

for their Kindle ereader.

A more fundamental continuity lies in the fact that, in being textual, the digital textual medium depends on the same dual skills of reading and writing, as do manuscript and print. Text is processed in the brain differently from the images that we watch and the sounds that we listen to, even though all now find themselves in what looks like one homogeneous medial space. This distinct form of cognitive processing is why textual mediums are in a category of their own. Whether by stylus and clay tablet, pen and paper, or keyboard and screen, writing means committing thoughts in the form of readable characters, which enable those thoughts to fly out and be read over time and space. It is the same writing and reading skills—taught in schools using manuscript and print—that are carried into the digital realm. Thus text, regardless of medial form, so far remains the chief way in which knowledge is transmitted.

The medium of the book as an agent of change

It was the invention, first of writing, but more so of the printing press, that encouraged the combination of scientific observation and human reason that we have come chiefly to depend upon since the Enlightenment to make sense of the world and our place in it. Text speeded up the process that ousted religion from its controlling and secure place at the apex of human knowledge. In writing and printing, we created instruments that allowed us to create an unlimited range of further instruments of exploration and creation, fostering the illusion that we have control over the world. Paradoxically, by the late 19th century the sheer quantity of books, and their common availability in smaller, lighter, cheaper, and thus ever more ephemeral formats, had begun to undermine their own authority. This was the case even if they continued to present the same kind of content, which increasingly of course they did not. In addition to books as products of the eternal search for truth—whether that was scientific, philosophical, or religious—more and more books became sources of fleeting entertainment. As the majority of books that came on the market moved into the realm of recreational reading, they were ready to be treated more casually.

The book's ubiquity had made it a democratizing force, as well as imbued it with the same sort of recombinatorial potential that characterizes the digital

medium. The more books that were being produced, and the more widely they were available at affordable prices, the more they represented a fount of knowledge to anyone with the inclination and intellectual ability to improve their understanding of any field of human endeavour. The same changing circumstances allowed readers all the more readily to find their own, un-canonical, way through that knowledge. As in the case of the digital medium, not all that was made public deserved the label of 'knowledge'. The deluge of reading matter, popular or otherwise, was a concern to people around the start of the 20th century no less than the uncontrolled information explosion of the early 21st is to us.

The changes in the place of the book in society took place gradually; in some cases over a period of centuries. Their impact is not comparable to the immediacy of the transformations in the field of dissemination and consumption that the digital medium has brought, with its two-way internet traffic, its ready accommodation of the smallest and most widely dispersed communities of like-minded souls, and its wealth of free access to the broadest range of products of the human mind. However, even if the *nature* of the changes in the Order of the Book did not resemble these digital transformations, and even if they were only slow and incremental, yet underneath the semblance of order still exuded by the book's unchanged interface and reinforced by the long-established infrastructure of bibliographical control, the transfiguration of the textual world had already begun. Certainly, the precipitate *rate* of change, from the end of the 19th century, prefigured the turmoil of 20th-century developments in the sphere of new mediums. A shift in textual discourse is taking place from an author-centred to a reader-centred orientation. The trend towards the production and consumption of shorter units of text also seems unmistakable.

The transformativity of the digital medium

It seems incontrovertible that the digital medium's transformative properties will affect the way we may *think* in the longer term. The digital medium is a way of transmitting knowledge of the world that is inherently unstable, is not ruled by discursive logic, and is informed by a democratic temper. These characteristics have already changed our ways of thinking—and our concept of the world—in various ways. The way we

construct knowledge, for instance, is rapidly becoming more social and more democratic, and so in the short run less fixed. This 'flattening' may well represent the next paradigm shift in our way of knowing. After the shift from knowledge based on religious authority to knowledge based on scientific authority, we appear now to be moving to a sort of social knowledge based on personal convictions.

In *Tomorrow's People*, the British cognitive scientist Susan Greenfield projects the effects of technology, departing from clearly established present trends. Since the mind is in a two-way relationship with technology, Greenfield writes, '[j]ust as we can ponder on how we will view new technologies, so those new technologies will impact on how we view the world' (p. 63). Not surprisingly, the technology Greenfield zooms in on in the chapter on education is the computer. She predicts a more immersive IT-based learning environment, suggesting that as a result perhaps 'future generations will no longer have the attention span or cognitive skills to follow the narrative of a story' (p. 167). She admits that 'we have no idea whether this new type of environment will be ultimately beneficial or deleterious. It could be the case that multimedia stimulation, assaulting the senses, hard-wires the brain for faster cognitive processing. On the other hand, what about reflection and imagination?' (p. 169).

As children and adults alike participate in novels and games, and as those same users have less and less practice at abstract thought, less imagination and less time for reflection, so there is a risk that the significance of facts and the desire to understand what is happening to and around you may diminish. [p. 174]

In the longer term, will our potential—and our willingness—to engage with the world analytically be affected?

Greenfield's exploration is, of course, speculative. However, being based on a thorough neuroscientist's understanding of the working of the human brain, it ought to make us pause. Is the scenario she sketches a cause for alarm? Only if we presume to:

... judge new minds by old values. Since the essence of the human brain has been, for tens of thousands of

years, adaptability to new external demands, perhaps we should simply face the fact that the new generation of brains will be fundamentally different from ours, in that they will be specifically suited, cognitively and physically, to computers and a cyber-world. [p. 169]

The immersive and fast world of text messaging and computer games is a long way from the contemplative, intensive reading of the pre-industrial era. McLuhan's style may have rubbed too many scholars up the wrong way, but he was nothing if not a visionary first of all in recognizing the insidious effects of medium technologies and secondly in surmising how they affect human cognition. The accelerating *rate* of change since McLuhan has intensified the effects.

Social factors

The rate at which new technologies are adopted is affected by a variety of external factors. A prime factor is consumer motivation. Depending on its perceived practicability, pleasure, and pay-off, willingness to try new technology may range from eagerness to active resistance. A powerful role is also played by the amount of persuasion, or even downright pressure, exercised by commercial interests on consumer motivation. An instructive comparison is with the way the chip card is being pushed by banks eager to reduce the cost of cash payments. Consumer resistance has not stopped banks from closing deals with government and business to stimulate its use.

The 'accretion' effect here plays a significant role. Invariably, a point is reached in the adoption process when it is speeded up, not necessarily voluntarily but as a result of the fact that the alternative is to be stuck with a dying technology or service. Here an instructive parallel is with mobile phones. After the critical point was reached when voluntary adoption of mobile phones had made the provision of public phones uneconomic, the remainder of the public were forced to adopt the mobile phone by the lack of a public alternative. The same looks set to happen in the case of the increasing online consumption of scholarly publications; initially journals, but eventually also monographs. Online consumption will drive up the price of their printed counterparts until the critical point is reached when it is no longer economic for publishers to produce them. Clearly there are advantages to the academic

community in having digital journals, but commercial interests are likely to be the prime driving force behind digitization. Either way, the driving force here is social rather than technological. In this respect it is worth considering a similar scenario for the case of ordinary books. Supposing that ebook readers are going to be widely adopted, there will inevitably come a moment when the number of people who choose a digital download instead of buying the paper edition reaches a critical level. This is the moment when demand for the physical product drops below the point where a paper edition can be economically produced. Below a certain print run, the book's retail price will simply become so high that people will elect to buy the digital edition instead, effectively putting an end to the print format (except in the more expensive print-on-demand form).

Not least, there is the government's role in speeding up or slowing down the adoption rate of digital alternatives to print. Governments at many levels may do so through any number of formal and informal policy instruments, such as the level of investment in infrastructure, the choice between providing digital or paper-based information and services, proffering or withholding digitization subsidies, sales tax regimes, and so on.

Technological versus social factors

While social factors may affect the adoption rate of the digital medium, it is the very existence of a technology (such as the digital medium) with its inherent characteristics that offers us potential usage scenarios. In that sense, it is the technology that can be said to cause the social changes, and the role played by technology is larger than that played by social factors. The limited extent of human social control over technology is clearly a major issue. It is one thing to create technologies that work. The real challenge is how to control them. Not only do they not necessarily turn out the way their inventors had envisaged, but they are put to uses no one had foreseen. Once a technology has been devised it cannot be put back in its box. If people see a certain use for a technology, that is how that technology will be used, regardless of social desirability, and regardless of the intention of any inventor or creator. This lack of control over technology has far-reaching effects in the case of medial technologies because mediums play

such a central role in the social construction of knowledge. Those effects are the more insidious because the human brain has a habit of trying very hard to make mediums invisible.

The basic imbalance between the social and the technological roles in the socio-technical mechanism can be explained by a 'memetic' view of cultural transmission. In *The Selfish Gene*,¹ Richard Dawkins first introduced the concept of the meme as a unit of cultural transmission in analogy to the gene as the unit of genetic transmission. Memetic cultural transmission is the transmission, through imitation, of units of culture, or memes, by human brains functioning as their vehicle. The memes obey their own evolutionary imperatives. As 'selfish' replicators, like our genes, the memes we create are bent on achieving longevity, fecundity, and fidelity of reproduction. However, just as genes adapt to the material and social conditions of their organisms in order to maximize their chances of survival, the memes, too, adapt to the circumstances of their human hosts.² In the socio-technical mechanism of cultural transmission, technology, like nature, has the upper hand over social influences, or nurture.

The obvious example of memes in the present context is medial technologies. As memes, medial technologies are of an unusual type in the sense that, while being memes themselves, they are also implicated in the process of copying other memes from one human host to another. They could be called 'meme-replication technology'. The longevity, fecundity, and fidelity to which memes aspire are aided significantly by the longevity, fecundity, and fidelity that can be bestowed on them by the various mediums employed in the copying process. An important characteristic of mediums as memes is that they aid the dissemination of memes not only vertically (i.e. diachronically, through time), like genes, but also horizontally (i.e. synchronically, through space). That the rate of cultural and social evolution is speeding up, leaving 'the old gene panting far behind', is explained well by memetic theory. Here the dual role of language and mediums is particularly obvious: writing, and *a fortiori* printing and the digital textual medium, are themselves causing the acceleration of change by helping the replication of new products of human culture. Small wonder, then, that books are beginning to be perceived as too slow for effective com-

munication, compared to the digital medium. Much of the most relevant thinking on digital culture happens on the Web, which in turn accelerates change. In fact, the speed of change is so fast that we are almost beginning to experience a generation gap, with younger generations thinking and working on this side of the divide, leaving older generations, brought up on a strict diet of print, feeling out of the loop on the far side.

As a consequence, the very concept of literacy appears to be in need of adjustment. Children appear to be comfortable with multi-mediality, non-linearity, and multi-tasking, processing streams of discontinuous information in which iconic and linguistic information are intermixed in a radically new way. It has even been suggested by some that they are able to follow—as well as reproduce—the narrative lines of a number of television programmes simultaneously and do their homework while maintaining their social network.

Illusion of control

There is a certain amount of cognitive dissonance in the way we continue to believe that we can have everything under control at the same time as we know that we cannot. Humans continue to play lord and master over nature and society, even as scientific research yields ever more evidence that free will is illusory.³ Yet somehow this fails to instil the necessary humility into our thinking. The risk that indeterminate and indeterminable long-term consequences of nanotechnology and bioengineering may affect us adversely is obviously huge. From time to time, the obvious lack of control we have over them raises concern that we are possibly insufficiently equipped 'to come to grips with the ragged fringes of human understanding—the unknown, the uncertain, the ambiguous, and the uncontrollable'.⁴ Yet, even then, all attempts to regulate the development and application of technologies with such obviously far-reaching consequences and their attendant risks fall spectacularly short.

Mediums, by contrast, are barely even regarded as technologies; especially the textual ones, which singularly fail to raise any concern, let alone alarm. Even most social scientists focus their interests on the human agents *behind* medium use, rather than on mediums as agents in their own right. True, as a technology, mediums must be denied a *motive* to change their us-

ers. But that does not mean that their use doesn't have any effects on their users. They are all the more insidious in their consequences for their innocuous appearance as neutral conduits.

It is not at all certain that such attainments of conventional literacy as rational discursiveness and the analytical habit *are* set to disappear as the digital textual medium gains ground. Moreover, it is not necessarily problematic should they do so. As Susan Greenfield suggests, the new generation of brains may simply adapt to the new reality. But it is important to realize that, should they disappear, then no one will have willed it to happen, and, what is more, no one will have been in a position to stop it from happening.

A reckless speculation

The computer's role in shaping us into what we are going to be cannot easily be overestimated. Its transformative properties as more and more textual traffic is moving from analogue to digital channels have already been spelled out. The speed at which the transformations are taking place has accelerated beyond anything we have seen before. To add to that, if the developments of the last century and a half are anything to go by, the future is going to be increasingly mediated overall. The dominance of the computer will inexorably lead to a diminishing importance of the printed book.

Roughly speaking, either of two scenarios may be envisaged. The first scenario is that the two medial systems will continue to coexist. In this scenario books will continue to be produced and read in large numbers, far into the future, even if they will not necessarily command the centre of the cultural stage. Besides the evanescence, non-linearity, and multi-modality of the digital medium, the book will continue to offer desirable fixity, linearity, and mono-modality. Even as it has come to the end of its evolution, the book cannot really be equalled as a pretty near-perfect 'reading machine'. The Order of the Book may lose its monopoly, but it will not give way to a digital order. Over the centuries we have come to cherish fixity and linearity, and it is simply too important to be able to read books anywhere, at any time—independent of electricity—to be able to scribble notes in the margin, to turn down the corner of the page to mark our place.

The second, competing, scenario is one in which we see the new medium asserting its ascendancy over the old. This involves the digital medium subsuming most of the crucial functions of print. Any characteristics for which a digital substitute may be devised will be assimilated. Other characteristics will gradually lose their importance. We may now think that some of them are worth holding on to, but that is merely because of our mind-set as *Homo typographicus*. Soon the sense that these features are important will lose its urgency, if only by a simple process of attrition. In this scenario, the Order of the Book will gradually morph into a digital order of sorts.

In favour of the second scenario is the consideration that there is no reason to assume that the relationship between print and the digital medium as it now exists is more than a temporary and utterly contingent state. The digital medium will continue to develop as it has done over the last few decades. As it develops, and as new generations of digital natives grow up, digital textuality will become evermore capable of taking over any remaining distinctive functions of print. In other words, it is only a matter of time before a digital order asserts itself. That a total eclipse of the book by the digital textual medium has not happened yet does not mean it will not happen soon. To set off the last small but vital development only a small trigger is needed.

The trigger that might set off the eclipse of the book need not be a technological one, of course; it could equally be one of the social factors discussed earlier. So far, in education, the book has remained the main vehicle for the transmission of knowledge. The education curriculum has always presented a natural vantage point from which the Order of the Book could be established and maintained. Here the hierarchical, orderly, and linear nature of the book's interface has always been notably at home. That interface represents a particular way of reading and using texts that is well suited to the hierarchical process of knowledge transmission. But in this natural habitat of the printed book—its last major stronghold—change is imminent. It has been noted that not only children's medial experience outside of school is becoming more and more important to them, but the discrepancy between their experience of mediums outside of school (dominated by digital games, mobile telephones, and computers) and inside school

(mainly books) is growing rapidly. Confronted with this concern, many educationists are now pleading for a medium use in the curriculum that better reflects the everyday reality of children outside of school. If this should lead to a major reduction in book use in education, which is not an unlikely scenario, this would be bound to undermine the very foundations of the Order of the Book. In fact, it would, not inconceivably, spell its end.

The codex form of the book has been with us a long time. Accustomed as we were to that form, not surprisingly, the computer was at first (as is usual with new mediums) made to emulate the book. Such continuity is a social instinct, but the book had also come to represent a pinnacle of achievement: the perfect reading machine. As *Homo typographicus* we did not want to give up what we persist in regarding as the achievements of typography. Increasingly, however, we will be able to recognize that, in essence, both books and their digital counterparts are tools for structuring and disseminating information, each with their own nature. Exploring the digital medium's own potential for structuring information, without constant regard to how it is done in print, will free us from ultimately unproductive attempts at recreating the book in digital form and allow us to discover the 'inherent possibilities' of the digital medium, thus speeding up the advent of a digital order.

One argument may perhaps be raised against this second scenario. Of the three criteria for measuring evolutionary success listed by Dawkins—longevity, fecundity, and copying fidelity—the digital medium has spectacularly improved on fecundity and copying fidelity. However, it appears (at least so far) to be letting us down badly in terms of longevity. But perhaps this is a classic pitfall of Darwinism. We should not be asking for the type of longevity that benefits *us*, but the gene (or, in this case, the meme) itself. From the digital medium's own perspective, its longevity would seem assured: the Universal Machine will be able to adapt to changing circumstances much better than any previous medial technology, including notably the printing press.

That this second scenario is the more likely scenario makes the future of our typographic heritage a pressing concern. For the younger generation, books and manuscripts may soon hardly exist unless they are available digitally. This raises the urgent question—one among many: which books and manuscripts will need to be

made available digitally? On the surface, the numerous mass digitization initiatives carried out by Google and others are answering that question for us: everything.

The reality is, of course, a different one. Not only is there much room for improving Google's digitization, but also current copyright restrictions are hampering the digitization of a very large body of very important texts, in fact covering much of the 20th and 21st century. A large and important part of the textual record is thus threatening to disappear below the horizon of the younger generation. A further important question, and one that remains definitely unanswered, is *how* digitization should be done in each of the scenarios. Our cultural inheritance needs to be made accessible to the digital generation in a form that speaks to them. Bridging the functional divide between the two textual modes will require a great deal of thought. Which properties of manuscript and print can be transferred straightforwardly to the digital environment? How do we deal with the ones that cannot be transferred easily? There are many challenges there, chief among them learning how to deal with turning the solid, unchangeable monuments of print into the continual, ever-changing events of the digital realm. We are trying, of course. One example has been the rendition of the Bible in mobile phone language. It is a translation of the most monumental and lapidary of books into the most ephemeral and unstable form imaginable for it. But is it a successful way of ensuring the continuing access to an important part of the Western cultural heritage? Are 'digital monuments' viable at all, or is the very term a contradiction?

Let's assume for the sake of the argument that the second scenario will indeed take place. Digital text is ascendant, and the eclipse of the printed word is imminent. How would we then know a digital order if we found ourselves in one? What would a digital order look like? One obvious characteristic would be for the digital interface to become as intuitive as that of the printed book. The digital reading experience would have to be no less satisfactory than that of a true reading machine. Perhaps more telling would be if we found the digital interface insinuating itself into our metaphorical language in the same way centuries of print did for the book. That would testify to the digital text acquiring a status in its own right. If sufficient new metaphors

developed we could surmise that the book was in the process of being replaced as an icon.

The computer as a medium will enable more intuitive forms of communication than text in written characters affords. Writing was, after all, a curious invention, considering the processing demands on the brain of the cognitive effort involved. Textuality may prove to have been contingent on a series of historical circumstances that are now coming to an end. It may be on the verge of being replaced by different, more efficient forms of machine-to-machine and machine-to-human communications. Susan Greenfield, for one, is confident that 'our future will probably not include such word-based communications' as word processing and e-mail (*Tomorrow's People*, p. 87). Experiments with the use of speech, both for interfacing with the computer's operating system and for text entry, are already proving successful, for instance. Digital photos taken with a mobile phone can be sent instantly to make reasonably eloquent statements of various kinds, and are increasingly used as a substitute for text-based communications.

Text has long coexisted with other modalities. However, each of these lived in its own realm. Digitally, text shares its medial space with all other modalities, opening the door to more direct competition from other modalities, existing or new. In the short run the

value of text has appeared to increase, as a function of the way we have been accustomed to interface with the computer over the last few decades. But in the longer term, other modalities may well prove to have advantages over text. What shape our machine-to-machine and machine-to-human communications might take is anyone's guess. For all we know, they may even involve brain implants and artificial telepathy. Whatever may transpire, it is certainly possible—and not even unlikely—that textual communication will come to be regarded as cumbersome, and be relegated to a less prominent position.

Whether or not this will indeed happen, medial changes are already occurring on a scale that would have been scarcely imaginable only a few years ago. The effects of these changes are vast. The world is not a given that just sits there passively and patiently waiting to be studied and eventually known. Rather, our mediums define our perception of the world: of ourselves and our culture. At the same time, our mediums are an important part of our culture. How may we know that culture if it determines our way of seeing it? How can we 'see our glasses' to determine how they give shape to what we are seeing? Or, as Paul Valéry said: 'So the whole question comes down to this: can the human mind master what the human mind has made?'⁵ ■

End Notes

- 1 Dawkins, *Selfish Gene*, chapter 11, 'Memes: the new replicators'.
- 2 As Daniel Dennett has phrased it, 'a human mind is itself an artefact created when memes restructure a human brain in order to make it a better habitat for memes' (quoted by Susan Blackmore in *The Meme Machine* (Oxford University Press, 1999), p. 207).
- 3 The more our scientific knowledge about the way the human brain functions grows, the greater the evidence that Spinoza was right, and it is merely a mistaken belief that our will is free.
- 4 Sheila Jasanoff, 'Technologies of humility: citizen participation in governing science', *Minerva* 41 (2003), pp. 223–44. See also Tenner, *Why Things Bite Back: Technology and the revenge of unintended consequences* (Vintage, 1997), and Cornelia Dean, 'Handle with care', *New York Times*, 12 Aug 2008.
- 5 Paul Valéry, quoted in Langdon Winner, *Autonomous Technology: Technics- out-of-control as a theme in political thought* (M. I. T. Press, 1977), p. 13.