WHAT IS MEMORY TODAY?

By FRASER WATTS

MEMORY IS CENTRAL TO HUMAN LIFE in many different ways. Some of these are purely practical. Many professions, such as police work, depend on good memory. The organization of our personal affairs depends on our remembering what people have said to us, and what we intend to do. Scholarship is of little value if we forget what we study. Memory is also important in deeper ways too. Our sense of identity depends on our remembering what has happened to us in our lives, and on making sense of it. Christianity lives off the memory of Jesus. Prayer and liturgy depend on our remembering the words of the Church.

Now it is clear that the technological and cybernetic revolution through which we are currently living is affecting how at least some practical aspects of memory operate. Need we fear that this will lead to such a far-reaching transformation of memory that we will become dehumanized?'

Aids to memory

Despite the importance of memory, most of us are all too conscious of how fallible and patchy our memories are. There are, of course, people who have exceptional memories, though these are not always what they seem. Those who earn their livings by displaying their powers as 'memory people' often turn out to be relying more on carefully devised strategies than on natural powers of retentiveness.

There is, in fact, nothing unusual about this. All of us use memory aids of some kind to compensate for the deficiencies of our natural memories. These fall into two basic categories. Some memory aids supply an artificial, external substitute for memory. Written notes, diaries, shopping lists and so on are used every day in modern life to support our limited and undependable memories. Over the last few hundred years, since the development of printing presses, books have become one of the most important supports to memory.

Memory aids have a long history and have taken many forms. Initially, pre-literate societies and those in which writing was rare and precious made considerable use of oral methods to preserve important

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matters in the collective memory.[1] For this to work well, things needed to be cast in a highly standardized form. For example, an epic story was frequently recounted in exactly the same words, often supported by music and poetry. Children also often display a strikingly accurate oral memory for their favourite stories even before they can read. It is highly likely that in the early Church, key Christian stories such as the passion were preserved, even before the writing of the first Gospel, by regular recitation in a standard form. Wedding and funeral orations are also an important part of the rituals of oral societies.

Other memory aids have made use of mental images or pictures. The Greek poet Simonides stumbled across this by accident in about 500 BC. He had been at a banquet from which he had been called away shortly before the collapse of the building in which it was held. Many of the bodies were unrecognizable in the ruins. However, Simonides found that he could go round the banqueting room in his memory, remembering who had been sitting where, and that enabled him to help the relatives identify the bodies. He developed this into a system. Whenever he needed to remember a list of items he would link them to special places in a room. The method was taken up by Cicero and others, and has continued to be one of the most effective memory methods.

Such methods were developed in a remarkable way in the centuries before the printing press. Because it was much more difficult to consult books for public knowledge, much more effort went into achieving an encyclopaedic memory of current knowledge, and various mnemonic systems were developed that are well described in Frances Yates' book, *The art of memory*.[2] One of the intriguing aspects of the story that Yates tells is that there was a resurgence of interest in these systems *after* books had become quite widely available. However, released from their initial practical purpose, memory systems began to take on a more spiritual significance. Being able to remember knowledge in a systematic form, rather than merely to consult books, became closely intertwined with occult Renaissance thinking.

With technological developments, there have been gradual changes in the kinds of memory aids most used. The general shift has been away from internal aids, and towards external ones. Written memory aids have come to be used increasingly. Books have long been the main source of public knowledge, and written notes have been the main way of remembering personal material. In this, our culture has become enormously different from earlier cultures that relied on oral traditions and mnemonic strategies.

Computers and memory

In very recent years, the widespread dissemination of the personal computer has brought about another revolution in memory aids, and there is now an increasing tendency to store material on computer disks rather than in written form. Computer disks have the advantage of being much more compact, and also of lending themselves to mechanical ways of *searching* for the required material. Word-processing programs have also made the composition of material in disk form much more flexible. For many people, computer memory has replaced notes and manuscripts as the principal way of storing personal material, though there has also been increasing use of disks to store public material. For example, a Bible on disk can be searched for key words or phrases in a much more flexible way than was possible with a printed concordance. This increasing use of computer memory as a support to human memory has been one of the major technological changes in modern life. So far, it has been quite selective in its impact in the sense that some people use computers heavily, while others use them not at all. Probably, in a few decades, they will be used almost universally.

Computers arouse strong feelings, and it is undoubtedly the case that many people view the widespread use of computers to support memory with some alarm. Religious people may wonder how this will affect the important role that memory plays in the religious life. Will it lead to an impoverishment of our sense of identity and devotional life?

It is helpful to remember here that printing presses aroused strong feelings too, and it is not clear that current worries about computers are any stronger than those aroused by the introduction of printing. We may have lost contact by now with the emotions aroused by the widespread dissemination of books, though the cultural impact of personal Bibles was, by any standards, a massive one. Yet, computers seem to be addictive, particularly in the form of computer games, in a way that books are not, even to 'bookworms'. The interactive nature of computer programs seems to give them a particular fascination.

Computers are also prone to be idealized by people who hold what can only be regarded as fanciful ideas about what computers will eventually be able to do. In the world of 'strong AI' ('artificial intelligence'), there is a belief that we will, before long, have computers that will have the intellectual capacity of human beings and will largely replace them.[3] These are ideas that belong more to the realm of science fiction than to foreseeable technology. However, they are widely believed. From time to time, secular movements take on some of the characteristics of eschatology, and the notions of people in the world of

'strong AI' about the computers that are just round the corner seem to me to be frankly eschatological in character.

In marked contrast, there are others who are almost phobic about computers, and believe they could never learn to use them. In part this is fuelled by computer engineers who often remain remarkably unsophisticated in attempting to design 'user-friendly' computer systems. Yet computers are often regarded with a distaste that reaches irrational proportions. The kind of phobia that some schoolchildren develop for arithmetic is combined with the hostility to technology that used to be found in the Luddities.

As has been indicated, the use of computers as a memory aid is by no means the first or the only such revolution in methods of supporting human memory. It is hard to judge how the use of computers rates in its impact compared with other previous revolutions in memory aids. I am inclined to think that it is less significant than the massive switch from internal to external memory aids that came with the frequent use of printed books. However, before considering further the significance of this switch to computer-aided memory, it is worth examining in more detail the relationship between human and computer memory.

Humans versus computer memory

It is important to emphasize at the outset that computer 'memory' is quite *un*like human memory. The point is worth stressing because of the increasing interest in 'artificial intelligence', in exploring to the limit the analogy between the human mind and the computer. Those committed to 'strong AI' are inclined to argue that the human mind *is* essentially a computer, and that the programs that run in the human physical brain are essentially the same as those that run on silicon in a computer. Up to a point, this has proved a fruitful way of casting theories about how the human mind works. To cast a theory about how human reasoning works, for example, in the form of a computer program forces you to be very specific about the mental processes involved.

However, in the world of AI, there has often been a tendency to exaggerate the similarities between computers and the human mind. This is sometimes supported by the loose application to computers of terms like 'memory' that come from human psychology. The key difference between human and computer memory is that the computer does not forget, at least as long as the power is not switched off at a critical moment! Also, when you access a record in a computer, it is retrieved in exactly the same form as it was created.

Human memory is very *un*like that.[4] It is a creative process in which what passes as a memory is reconstructed. When you are searching

computer memory, the relevant record is usually stored in just one place. You may entirely fail to locate it, but if you find it at all you will retrieve it in complete form. People, in contrast, can usually remember something of what they are trying to remember, but seldom everything. Details tend to be lost, but the gist recalled. Key information, like your name is remarkably durable in the sense that, even when the brain is severely damaged, the name is generally still retrievable. A computer either works perfectly or it crashes. Human memory, in contrast, shows what is called 'graceful degradation'.

Research on human memory has led to the gradual abandonment of the idea that remembering is a matter of simply accessing a memory trace that is stored intact, waiting to be recalled. The abandonment of that view was summed up nicely in the engaging title of an article by James Jenkins, 'Remember that old theory of memory? Well, forget it!'[5]

The seminal work that underpins the modern understanding of memory as a creative process was a book, *Remembering*, published by the Cambridge psychologist F. C. Bartlett in 1932,[6] though its significance was not realized until long after. Bartlett took the important step of breaking away from what had been the dominant tradition in the study of memory for many years, which was to study memory for lists of meaningless 'nonsense syllables' in the hope that studying memory without meaning would lead to the discovery of 'pure' memory processes.

Bartlett characteristically asked people to read and remember short stories, his most famous being 'the war of the ghosts'. He noticed that people almost always recalled the story in a way that was shorter, more coherent, and more in line with their own assumptions than the original. Puzzling or unfamiliar material was either left out or reconstructed to make it more intelligible. In a sense, people remember things in their own image. It is a creative process in which the mind of the rememberer is displayed.

Subsequent work has emphasized in similar vein how important our current mood is in affecting what we recall. If we are unhappy, we selectively recall sad things; if we are happy we selectively recall good things. The memories we have of any particular moment arise out of an interaction of the past and the present. When we remember, we creatively reconstruct the past in the light of the present.

Personal memory

This creative, interpretative aspect of memory is of enormous human importance. It is through the way in which we remember things about

ourselves that we form a sense of our own identity. Equally, it is through our memories of people and events that we form our view of the world in which we live.

It is very important that our personal memories remain *our* memories. The act of remembering what has happened to us through our lives helps to make us what we are.[7] Continuity of personal identity depends as much as anything else on the stream of our memories. In large part we *are* our memories. Those whose memories are partly obliterated following a head injury appear thereby to lose an important part of their identity. In the religious life, our sense of who we are in relation to God's vocation for us arises out of reflection on our personal memories.

We also transform ourselves by recasting our memories in a new form. This reworking of memories is central to psychotherapy, as every client and therapist knows. Memories of painful episodes are brought out and examined afresh in the context of the therapeutic relationship and cast in a more helpful perspective. Because human memory, unlike computer memory, is a creative process, it gives us the opportunity to reinterpret the past.

This process of transforming memories is central to prayer. Indeed, a good deal of prayer is occupied in reviewing in the presence of God what has happened to us recently. Particularly important here is how we review our painful memories before God; prayer gives us a chance to play creatively with our difficult memories in his presence. The relationship with God acts as a counterpart to the therapeutic relationship in psychotherapy. It enables us to see things from a new perspective, more from a 'God's eye' point of view, in which things appear in a new light. The Church's collective memory of Jesus also becomes part of the context in which our own memories are recalled. The transformation of memories is one of the highly personal ways in which new life comes out of pain and crucifixion and, because we so very much *are* our memories, when our memories are transformed, we are transformed.

One particular part of this is reflecting in a new light on *why* things have happened. Often, in an egocentric way, we see things as too much the result of our own efforts or failings. When things go well that leads to too much pride; when they go badly it leads to too much sense of inadequacy. Prayerful review of our memories helps us to see God as our partner in everything that happens to us.[8] In giving thanks for the good things, we see God's hand behind them, and that liberates us from some of our false pride. Through thanksgiving, we are transformed ourselves and we deepen our relationship to God.

Threats to natural memory?

How will these important aspects of memory fare in a computer age? There may be concerns that the greater use of memory aids will be in some sense dehumanizing. Will the increasing use of computer memory facilities undermine our use of natural memory for things that are distinctively personal?

One might equally have argued that for someone to use the artificial aid of a diary to assist their autobiographical memory would be dehumanizing and would render it relatively impersonal. In fact, I doubt whether this is the case. On the contrary, keeping a diary seems to facilitate personal reflection on our lives. The act of writing the diary is itself a helpful form of personal reflection. Also, even if we are reworking our memories, it is helpful to have, as a counterpoint to that process, an unchanging record of how things looked to us at the time. That is especially helpful if our present mood is distorting the past overmuch, unconsciously creating a past that simply fits in with our current feelings.

If diaries can play a helpful part in personal reflection, there is no reason why it should be different if a computer disk were used to store the diary. The memories would still be *our* memories in the sense that they were recorded, albeit on a computer disk, as we had remembered them. It would be conceptually inappropriate to speak of them as the *computer's* memories.[9] Computers cannot construct their own memories of what has happened to us; they can only store our memories.

The question may also arise of whether the increasing use of memory aids will not in some way weaken natural memory. There is a danger here of reasoning on the basis of mistaken assumptions about how memory works. For example, there has been a persistent set of assumptions known as 'faculty psychology', according to which, for example, there is a faculty of memory that is strengthened with use and weakened with disuse. Modern experimental psychology has generally given no support to such 'faculty' assumptions. The effectiveness of memory certainly varies, but the simple level of use or disuse does not seem to be the critical factor. It is more a matter of having effective memory strategies at one's disposal. It can be admitted, of course, that those who rely on their memory a good deal are perhaps more likely to develop such strategies.

Human memory plays to its strengths when we use it to distil the gist of what needs to be remembered. Of course, there are times when it is helpful to supplement natural memory with some kind of memory aid. For example, natural memory of a committee discussion can give an accurate record of what was said, but it is still valuable to supplement

this with personal memories of the gist of what was said. People have an irreplaceable ability to recall what was said in a form that brings out the dynamics and purpose of the discussion. There is a good prospect of natural memory and computerized memory aids being used in a helpful conjunction. Indeed, the new generation of highly flexible, computer-based memory aids may in some ways liberate human memory to be used more effectively for what it can do uniquely well.

It is worth recalling again that the introduction of printed books did not lead to the abandonment of mnemonically based systems of comprehensive knowledge. Rather, it led to these systems being retained and used in a new way with a more distinctively spiritual, even occult purpose. I believe that the combination of natural memory and increasingly powerful memory aids is potentially valuable and enriching. It is only important that we do not lose sight of when and how to use the various approaches to remembering that are now available to us.

In looking at the respective contributions of natural and computer memory, it may be helpful to draw an analogy with the comparison between a painting and a photograph. If we simply want an accurate record of a building so that we know how it looked before restoration, a photograph is clearly preferable. However, if we want to depict the building as a way of reflecting on its significance and appeal, a painting is more appropriate. In similar vein, computer records reproduce with complete accuracy what is entered into them, whereas human memory is fallible but creative. Both photographs and paintings have their place. So do human and computer memories. The challenge that now faces us is to learn when and how to use each to the best advantage.

If this general conclusion is right, the religious life, as something that is highly personal, is probably one of the contexts in which computer memory will make relatively little contribution. If, however we evolve a sensible system of using natural and artificial approaches to memory when each is appropriate, there is no reason to think that the increasing use of computer memory in other contexts will undermine the use of natural memory in the religious life.

NOTES

[1] There is a helpful essay on oral memory among the Wolfson Lectures on Memory, published as T. Butler (ed), *Memory: history, culture and mind* (Blackwell, 1989).

[2] Yates, F. A., *The art of memory* (Routledge, 1966).

[3] See, for example, H. Moravec, *Mind children: the future of robot and human intelligence* (Harvard University Press, 1988).

[4] Much the most readable and authoritative book on the psychology of human memory is A. Baddeley, *Your memory: a user's guide* (Prion, 1993).

[5] J. J. Jenkins, 'Remember that old theory of memory? Well, forget it!' in *American Psychologist* 29, pp 785–795.

[6] Bartlett, F. C., *Remembering: a study in experimental and social psychology* (Cambridge University Press, 1932).

[7] There has recently been a good deal of research interest in autobiographical memory; see, for example, M. A. Conway, *Autobiographical memory: an introduction* (Open University Press, 1990). However, the research has not yet focused on particularly *personal* aspects of autobiographical memory.

[8] See the chapter on prayer in F. Watts and M. Williams, *The psychology of religious knowing* (Cambridge University Press/Geoffrey Chapman, 1988/1994).

[9] Harre, R., *Personal being: a theory for individual psychology* (Basil Blackwell, 1983), especially pp 51–55.