FT FINANCIAL TIMES
World business newspaper

What do we want to say to our far-off descendants and how can we say it?

By CHRISTIAN TYLER.
2,069 words
7 June 2000
Financial Times
1
English

- WEEKEND FT - Christian Tyler looks at efforts being made to step back from the **whirlwind of modern life**, What do we want to say to our far-off descendants - and how can we say it?

The ancients remembered us. Not only did they raise egomaniac pyramids and chip messages in stone. They built great cultural institutions such as the library at Alexandria where, from the beginning of the 3rd century BC, scholars, amassed literary classics for posterity. If that library had not been destroyed in a Roman civil war of AD272, their bequest to us would have been greater still.

Something of the same spirit is being shown today by a group of visionaries in California, capital of electronic culture. Stepping back from the **whirlwind of modern life**, they are debating what should be saved - and how we should save it for our descendants 10,000 years hence, people as far from us in the future as our hunter-gatherer ancestors in the past. A conference organised by the Long Now Foundation and Stanford University will be held at the university library in Palo Alto at the end of this month.

A paradox of human civilisation is that the older its records, the longer they last. We can read the shopping lists of the ancient Minoans from 1200BC; but our own memos are unlikely to last a generation. The more we generate, the less we leave for posterity; and the process is accelerating.

As any librarian will confirm, there is a trade-off between conservation and convenience. The easier it is for readers to inspect a document, the shorter its life will be - which is why, for example, the British Library has made a digital copy of its 1,400-year-old Beowulf manuscript.

Technology prefers efficiency to durability. So clay and stone gave way to parchment, papyrus and paper. Parchment is still robust, and papyrus has lasted 2,000 years. The best paper from China, made from cotton or linen, has survived more than 1,000 years but the machine-made Wood pulp paper introduced after 1850 is already decaying. High-grade microfilm is good for up to 300 years, but more usually 10 to 100. Music CDs degrade after about 15 years, magnetic discs and tape after five or 10. And the average life of information on the internet is 44 days.

Much of the data gathered in the 1960s and 1970s has already been lost, either because the material it is stored on has decayed or because the machines for reading it are obsolete. Among such losses are the findings of the Mars space lander Viking, satellite surveys of the Amazon forest and land maps of New York State.

"We have an amnesiac civilisation with a very short term memory," says Stewart Brand, father of the Whole Earth Catalog, a 1960s bible, and one of the library conference organisers.

Finding a way to talk to the future is not just a flight of fancy. Our descendants may want to know about Shakespeare and Sappho, but there are also things they will need to know: such as where we have buried our radioactive waste.

"There are other examples of our ancestors' foresight. The Japanese empress Shotoku in the 8th century had 1m copies made of a Buddhist incantation, the hyakumanto darani, and distributed it to shrines all over the country in pagoda-shaped caskets. It has survived to this day. Similarly, the founders of New College, Oxford, planted oaks for the building's maintenance which were used to re-roof the hall 500 years later. (The story, spread by American alumni, is not quite accurate, but it makes the point.)

The present supplies other examples. Since time and space are aspects of the same continuum, talking to the future is not unlike trying to communicate with aliens. In the hope of finding somebody to say "hello" to,

the space probes Pioneer 10 and 11 carried a 6in x 9in aluminium plaque etched with a drawing of two naked humans, cheerily waving.

The 1977 Voyagers took a disc of earthly sights and sounds, including a Gregorian chant, the mating calls of whales, the sighing of a lovesick woman (actually Carl Sagan's new girlfriend), Glenn Gould playing a Bach prelude and fugue, and Chuck Berry singing "Johnny B Goode". This is time-capsule stuff.

For the 1997 Cassini-Huygens mission to Saturn, the science artist Jon Lomberg, who had been involved in previous ET-mails. suggested something more sophisticated. He and his colleagues proposed to etch a 2.8cm diamond disc with images and diagrams of the solar system on one side, and on the other an explanation of the binary code and two photographs of a group of humans taken on the beach near Lomberg's home in Hawaii.

To forestall cries of protest like those which had greeted the Pioneer drawing "that the figures were nude and the woman was shown too small', they had all but the youngest children in the photo clothed and a black granny seated at the centre. To no avail.

Earthly dissent proved stronger than intergalactic diplomacy. The professional jealousy of a woman astronomer put paid to the scheme, according to Gregory Benford - a science fiction writer and physics professor who described the affair in his Deep Time (1999).

Instead, the craft flew off with a list of 616,403 American names - as Benford says, the ultimate "Kilroy-was-here" greeting.

Much closer to home was the problem of WIPP, a $1.8bn nuclear waste .dump dug 2,000ft under the New Mexico salt flats. The US Congress had demanded that the Waste Isolation Pilot Plant, designed to take 800,000 barrels of low-grade waste and commissioned last year, should be secure from human prospectors for 10,000 years.

Recruited also for this project, Lomberg and Benford soon found that trying to read the minds of our putative heirs was no easy business. Would they have reverted to barbarism? Would the US have been replaced by the Free State of Chihuahua?

Should the site be marked, or would it be safer left hidden, like Tutankhamen's tomb? If early European travellers to the Middle East thought cuneiform writing was decoration, what warning signs would be understood? And how could they be protected from souvenir hunters?

They found a rusty plaque at the nearby site of Project Gnome, a 1961 nuclear test. It was not an encouraging model. In now barely legible letters it said: "This site will remain dangerous for 24,000 years."

The WIPP designers also had to be wary of how symbols can change their meaning. The skull-and-crossbones symbolised resurrection before it warned of pirates or poison, and the swastika was once a Hindu sign meaning good luck. Markers and warnings will not be put up until the dump is full, in 50 or 100 years. And then, no doubt, a new panel will be convened. "I hope our work will serve as a guide," says Lomberg. "But since it will all happen after I'm dead, I guess I'll never know."

Safe custody is the key to continuity, as the Japanese empress Shotoku realised. Another who recognises it is David Wild, a young Yorkshireman recently appointed to handle public relations for Nirex, the British nuclear waste company which in the 1980s failed calamitously to get planning permission for its burial sites.

Wild is investigating how institutions can be built to survive - he cited as possible models the Roman Catholic Church, the British Treasury and the Irish Guards. "Our main problem is how to get people to face up to their responsibilities now, yet give future generations some flexibility," he says.

Shotoku also show I that the way to ensure continuity of records is to multiply them. "The Library of Alexandria was burned down," says Margaret MacLean, chief organiser of the Stanford conference. "We have to learn the lesson of that and go for a distributed archive this time."

Whether the 10,000-year library will become a reality is a moot point. "The whole thing is 'a thought experiment, more a metaphor, a tool for the imagination," says Jim Mason, an artist and anthropologist who will be attending.

But there will be no lack of ideas. Some want to make a Golden Canon of the world's 1,000 - or should it be 10,000? - best books. Others think cookbooks and cat-combing manuals should be included along with Cervantes and Proust. Some talk of a CD Rom for "rebooting civilisation" in case of an asteroid wipe-out. A former editor of Wired magazine, Kevin Kelly, wants a universal library in which everything is available free to everyone, everywhere. Stewart Brand hopes for a "library of life", a global biocensus enumerating the

1.4m named species - and some of the other 30m as well. The inventor Brewster Kahle has already started an internet archive, in which everything - but everything - is saved.

"How do we know what future historians want?" asks Brand. "Wouldn't any historian just love to have had Julius Caesar's e-mails? What incredible data!"

But even more urgent than the question what to keep is how to keep it. How can institutions be trusted to "migrate" their digital data into every new format as it comes along when formats are changing every 10 years?

Nor will things slow down.

As MacLean pointed out, the computer industry has no incentive to think about the very long term indeed, quite the opposite.

Yet what technology destroys it can also save. And there are methods to hand. One is called ion beam lithography. Developed by an Oregon company, Norsam Technologies, with Los Alamos Laboratories, it is a process for engraving text or images on diamond, nickel or polymer. A demonstration disc nicknamed the "Rosetta", after the stone slab which provided the key to deciphering Egyptian hieroglyphs, will be shown at the conference.

On to a single, 2in diameter nickel disc are being inscribed the first three chapters of Genesis, plus vocabularies and orthographical notes, in nearly 1,000 languages from Algonquin to Uighur. About 25,000 pages of text will be crammed on to a piece of metal small enough to be worn as a pendant. Microscopes will be provided.

The process works up to a density of 350,000 pages per disc, said Jayant Neogi, the Calcutta-born scientist who founded the company. At that level only a scanning electron microscope can read it.

Neogi has stamped diamonds with invisible security marks for De Beers and is negotiating with two American libraries. He is also talking to the Mormon church in Salt Lake City, which needs to save its famous, but decaying, genealogical records.

"They have 2bn microfilms and add 60,000 a year," Neogi said. "At our present rate of output it would take, us 18 years." But he claims his nickel discs will last well over 1,000 years, and many thousands, if enclosed in oxygen-free capsules.

Both the conference and the Norsam "creation" disc are sponsored by the Lazy Eight Foundation,

a freewheeling think-tank set up by octogenarian Charles Butcher who turned a family floor-wax business into a "sanitary maintenance" empire. The Long Now people are also planning to build a giant 10,000-year clock in the desert.

"We are still in the Dark Ages in terms or working out standards for this kind of work," says Mark Roosa, head of conservation at the US Library of Congress which houses 119m items, including 22m books on more than 500 miles of shelves. "The digital future is coming quickly, and yet we have to think slowly and deliberately to get agreement."

His worries are echoed across the Atlantic at the British Library which, in a couple of years, will be

required to house electronic as well as paper records.

"The trouble with the stuff which is born digital is that without the software it's gibberish," says Helen Shenton, the library's deputy director of preservation.

"You can't tell if it's words, pictures or music. What do we do? Just run it all off on to paper?"

Or nickel discs?

"That's going back to chipping on stone," she said. And so it is.

Document ftft000020010808dw670161b

