

# 1

## THE TROUBLE WITH PICTURES

---

**I**n the fifteenth century, when a few philosophers began to wonder about the mysteries left by ancient peoples in the Nile valley, the idea arose that the pictures on Egyptian tombs were the purest form of communication. It was an odd notion, given that no one had a clue what they meant, but it was based on what classical authors had written centuries before, and that had the smack of authority. So it was assumed that in these pictures, Nature herself had been captured in a mystic code, and would address the elevated soul in her own pure tones, without the necessity for anything as base as script which, like language, reflected mere babble, in its biblical sense – the confusion imposed by God on mankind by the destruction of the

ALPHA BETA

Tower of Babel. There were, of course, those who claimed to be on suitably intimate terms with Nature. A sixteenth-century Jesuit antiquarian, Athanasius Kircher, set about interpreting hieroglyphic, starting with an obelisk now standing in Rome's Piazza Minerva. One little sequence of signs merely records the name of a sixth-century BC ruler: 'King Apries'. This is Kircher's confident interpretation: 'The protection of Osiris against the violence of Typho must be elicited according to the proper rites and ceremonies by sacrifices and by appeal to the tutelary Genii of the triple world, in order to ensure the enjoyment of the prosperity customarily given by the Nile against the violence of the enemy Typho.'

It was all nonsense. Hieroglyphs are not 'pictures'. They are signs, and syllables, and letters, and experts now read some of them almost as easily as they read their own script. The magic, in its eighteenth-century mystical sense, has gone.

An underlying magic remains, of course: that of literacy itself. It is an astonishing thing that human beings should be able to see marks on a surface and hear them talk of realities visible and invisible. But if Nature is to be understood through writing, she has to be pinned down, summarized, abstracted and recorded by one intelligence in a form understandable by another. For that, the two must share the same, or overlapping, assumptions. Without those links, pictures – whether

## THE TROUBLE WITH PICTURES

cave paintings or computer-screen icons – can never be enough to transfer meaning from mind to mind. No one unversed in computers would know what the hieroglyphs along the top of a screen are for. Even the simplest ones, like the cut-and-paste symbols, refer to a technique few have ever used. Click-and-drag, yes; tear-and-staple, perhaps; but cut-and-paste? Not these days. It works, of course, because we all played at cutting and pasting as children and because PC-users learn a shared hyper-language, computerese. But as the cultural links stretch, understanding becomes obscured. Does the image of a figure in a skirt say ‘female toilet’ to a kilt-wearing Scot as surely as it does to trousered Sassenachs? A hard-hat symbol means ‘wear hardhats (and if you don’t have one get one)’, but a wheelchair symbol does not mean ‘sit in a wheelchair (and if you don’t have one, get one)’. Ambiguities can never be ironed out with pictures alone, because the human brain is not set up to process them as it processes language. The 2000 or so separate images that can be stored by the average brain, with effort, are as nothing compared to the 50,000 words which most literate people can muster in most languages with ease. It is an enduring dream, this mystical belief that somehow mind can read mind through pure imagery, but there is no transcendental written language, and can never be one. Here are three true stories which show the inadequacy of pictures, and the necessity of script.

## ALPHA BETA



South from Iraklion on Crete's northern coast, the road leads through vineyards, into mountains, up to the Askyphos Pass. Beyond a rise of seared grass and gnarled trees, a glorious view unfolds: a quilt of olive groves, orchards and wheat fields, running away to distant hills. This is the plain of Mesara, a rich area for 4000 years. As Bronze Age tombs reveal, the well-to-do, after lives spent trading oil, cereals, wine and figs, were buried swathed in rings, necklaces and diadems, and surrounded with obsidian, gold, silver, copper, tin and elephant ivory. By 1700 BC, the culture named after King Minos controlled all Crete. Palaces – Knossos, Malia, Zakros – dominated these plains and their ports. Ahead, pale in the distance, the land rises to a low plateau, and ruins. There, another of the great Minoan palaces once stood: Phaistos.

Phaistos, or 'Festos' in its more recent transliteration, is the site of one of the world's most intriguing and baffling finds, made by an Italian archaeologist, Louis Pernier, a century ago. This was a time of high emotion, both political and academic. Crete was in turmoil, emerging bloodily from Turkish rule, while archaeologists sought primacy for themselves and their countries by wringing fact from myths and buried rubble. On the Turkish and Greek mainlands, Heinrich Schliemann had uncovered the ruins of Troy and the treasures of Mycenaean kings, and planned to match these achieve-

## THE TROUBLE WITH PICTURES

ments in Crete. But in the face of Greek violence and Turkish oppression, Schliemann pulled out, leaving the ground to the Englishman, Arthur Evans. He began digging in Knossos in early 1900, revealing the outlines of the entirely unknown culture he named 'Minoan' after its greatest king, Minos. Italian archaeologists wanted matching glory. Pernier's boss, Federico Halbherr, who had already made stupendous finds on the plain of Mesara, ordered Pernier to look beyond, to Phaistos. It was a promising site, for it was listed by Homer among the homes of those who mustered before the siege of Troy.

In the spring of 1900, Pernier and his team, based in a nearby monastery, sank the first trenches across the ruins. Over the next few years, the outlines of a great palace of a hundred rooms emerged. Off to one side, gypsum paving led to the remains of eight little storerooms. On the afternoon of 3 July 1908, some of Pernier's team scratching away at earth, ash, charcoal and some bits of pottery in the eighth storeroom, came across a disc of baked clay about 16 cm (6 inches) across. On each side was a spiral of 241 little pictures (242 if you include one that seems to have been erased). It was writing, of an unknown kind.

Minoan officials long kept their accounts in writing, incising symbols on clay. Originally this had been simple picture-writing, so-called Cretan hieroglyphic. Later, by 1700 BC, Cretans had devised a second script now known as 'Linear A', which is still undeciphered. Later still, after

ALPHA BETA

the fall of the Minoans, Greek colonists used a third script, 'Linear B'. But the Phaistos Disc was written in none of these, nor in any other known script.

Pottery found nearby and the architectural style of the storeroom both suggested the disc was squirreled away around 1700 BC. This is not a date to swear by, for other, later pottery was found in the same little room, and besides the disc could have been moved during excavation. Pernier's workmen made their find in the morning; Pernier turned up in the late afternoon, impeccably dressed, to be shown the day's work; so it could be that the disc was made later, but somehow strayed into earlier shards. If it was made around 1700 BC, the date is of some significance for Minoan studies, for about this time Minoan palaces went up in smoke, probably as the result of an earthquake, followed by looting. From this catastrophe the Minoans recovered, rebuilding anew on the foundations of the old. In Phaistos, the palace was restored, but no one bothered with the little storeroom and its enigmatic contents. It lay hidden or forgotten, until Pernier unearthed it.

Since then, scholars and lay people have puzzled over the disc, now in the Iraklion Museum, and over its copies, and over enlarged photographs, wringing information from it. The most astonishing thing about the disc is that the crisp little signs are not drawn on the clay. They are carefully printed, by well-made, hard stamps. This makes the disc the first known example of printing.

## THE TROUBLE WITH PICTURES

Clearly, it was not a one-off. The stamps would have been used to print other clay tablets. What were the stamps made of? Wood? No: the images are too hard-edged. Even if some superb carver had made the blocks, they would have worn quickly with use. It is hard to imagine wood-carvers making set after set. The blocks would have been made of metal. And since bronze and iron are coarse in detail, the best material for making such stamps was gold, cast in clay moulds.

Detective work has revealed a few other details. From its irregularity, the disc was hand-made, not set in a mould. Many (some say all) of the 45 individual pictures can be identified – a skirted walker caught in mid-stride, a head with Mohican-style haircut or headdress, a knob-bly club, a captive, a child, a woman with wild hair and dangling breasts. They divide into groups, which could be words or phrases. The stylus marks show that the spiral was drawn from the rim inwards, in sections, and that the signs were imprinted as the spiral was drawn. So the script reads anti-clockwise, from rim to centre. One side is stamped more gently, presumably in order not to flatten out the first set of impressions on the obverse.

Two other finds with several similar symbols suggest the disc was local. But there are many other possibilities. Greek culture was in its infancy, but the Egyptians had over a thousand years of development behind them. The Hittites dominated central Turkey, the Assyrians ruled Mesopotamia, the

ALPHA BETA

Phoenicians were reaching out from their eastern Mediterranean homeland. All were linked by trade across the Himalayas to a civilization in the Indus Valley. All traded through intermediaries with China. All had their own writing systems. And none of them looked anything like that on the Phaistos Disc. Some culture, probably in the eastern Mediterranean, probably around 2000 BC, found it worthwhile to devise these signs to represent their language.

The signs were probably syllables – because every other local culture wrote in syllables – but possibly individual words, like Chinese, possibly a combination of the two. Some wealthy group then commissioned artisans to make golden stamps, which were used to print messages on clay – an operation that would surely have been done many times, using the same or similar clay moulds, perhaps over many generations. A baked disc makes a handy shape to record signs of this size. There must at one time have been hundreds, thousands, perhaps tens of thousands of such discs scattered across the eastern Mediterranean.

If others survive in some buried archive, a new discovery may one day make all clear. At present, speculation is all we have, in plenty. If the early clay tablets of Sumeria are anything to go by, this could have been an inventory, perhaps that of a cargo ship. But when almost all is guesswork, there is much leeway for eccentricity. A quick search of the Net reveals people convinced the disc is a

## THE TROUBLE WITH PICTURES

magical text ('possibly a curse'), a geometrical theorem, a calendar, a Bronze Age computer. Here's someone certain that it records an expedition of mountain people seeking flat land for settlement. Someone else, with messianic self-assurance, states that the disc records the beliefs and practices of the Osiris cult, whose adepts communicated with the stars 'and beyond through interdimensional travel'. You want proof? In the signs, you can make join-the-dot outlines both of the Great Pyramid and the constellation Argo, which means there is a 'star portal' in Argo. Obviously, the disc is a key to the use of 'portal geometry' and the salvation of the soul of the world.

The sad truth is that so little can be gleaned from the disc that it acts as a sort of ink-blot which can be made to mean almost anything you want it to mean. There is not much hope of deriving anything more. It takes many more symbols than this, and some link with a known language, to decipher an unknown script. Unless some bilingual key is found, the disc's language, script and information content will remain for ever enigmatic.



In late 1971, two Pioneer probes were about to be launched on a planetary tour that would eventually take them out of the solar system. Two science writers, Eric Burgess and Richard Hoagland, were shown Pioneer 10 by NASA, and had an idea: 'We decided in a split second

ALPHA BETA

that very afternoon that Pioneer should – must somehow – carry into Infinity a literal “Message from Mankind.” They put the idea to the astronomer Carl Sagan. Sagan and his wife, Linda Salzmann, were given a few days to devise something suitable.

The aliens would, perhaps, not be sensitive to light in the visible spectrum. But, in the same way that we have discovered how to use X-rays and infrared radiation, these aliens would by definition be advanced enough to retrieve a probe and study its little plaque. They would wish to know the origin of the strange artefact. Would it be possible to communicate this information in a form so pure that it would be independent not simply of language and script, not simply of human culture, but of human intelligence? Was there a way for intelligence to speak to intelligence in written form? Sagan suggested that there was, if the message were engraved on a plaque in a language that is woven into the fabric of the universe. This, he argued, would provide the link with any culture advanced enough to find the Pioneers (for the same plaque was also attached to Pioneer 11, which was also due to leave our solar system).

The plaque uses an atom of the universe’s most common element, hydrogen, to provide two units. Its wavelength (21 cm) gives a unit of distance, its frequency (1420 megaHertz, or 1420 million cycles per second) a unit of time. Using just the two on-off symbols of binary code, these units can spell out numbers of any size. Sagan

## THE TROUBLE WITH PICTURES

decided to specify the probe's origin. Since our Sun has no special traits to mark it out from a billion others, Sagan focused on stellar rarities known as pulsars, super-dense stars that spin at astonishing rates, averaging about twice per second (with the fastest known pulsar spinning 625 times a second). At each revolution, the star emits a powerful radio pulse. Each pulsar is unique, with its own spin-time that is accurate to one part in 100 million, probably for hundreds of millions of years. Sagan chose fourteen 'local' pulsars and created a star-burst pattern that gave a rough indication of their direction and distance as seen from the centre of the Galaxy. Their frequencies in hydrogen-atom units he labelled in binary. Scientifically advanced aliens would, in theory, know about hydrogen atoms and pulsars, and thus be able to pinpoint the region from which the probes came. Other sections of the plaque sketched our solar system, whose collection of nine planets must surely be unique in this corner of the galaxy. A line connects a Pioneer icon to the third planet.

Sagan also included two odd-shaped patterns, which we see as a man and a woman, both naked. However different the aliens might be, they might perhaps deduce from the very oddity of the patterns that they represent biological objects, even if the extrusions and dangly bits remain inexplicable. A drawing of Pioneer provides a scale.

But here we reach the limits. Information about the universe, coded mathematically, is all very well. Sagan's plaque, like computer icons, may speak in a hyper-

ALPHA BETA

language provided by the universe. Athanasius Kircher might have considered himself vindicated: you see, Nature does speak! It certainly *looks* like communication. We shall never know. It will take Pioneer 10 65,000 years just to get out of the Sun's gravitational reach, and some 100,000 years to pass the nearest star, assuming it's heading in that direction. The chances of it ever being found before it is shattered or eroded away by space debris is remote. In fact, more cynical minds point out that the intelligences to whom Sagan directed his message were right here on earth: members of Congress who provided the funding for further space projects, like the Search for Extraterrestrial Intelligence, a line of research close to Sagan's heart, and the general public who, as a result of the publicity generated, would bring pressure to loosen purse-strings. Whatever appeals it may have for aliens, the plaque certainly appeals to those who still hold to the dream of perfect and pure communication.

Despite its complexity, the plaque contains not a shred of human information, other than the shape and size of its two puzzling exemplars, because to convey any more information about us demands language, and language cannot leap the gulf to the stars.



Or even leap cultures.

In the early 1980s the US Nuclear Regulatory

## THE TROUBLE WITH PICTURES

Commission, part of the Department of Energy, was wrestling with the problem of nuclear waste. The government was considering a number of short-term solutions, which included burying the waste hundreds of metres deep in remote desert areas. But this stuff would still be radioactive in 10,000 years. The members of the commission wanted to cover every contingency. Who could guess what the world would be like then? Perhaps it would be an age of technological wizardry, which had long since learned to de-activate uranium. Then again, perhaps not. In a thousand years, let alone ten, cultures fall, languages vanish and barbarians arise. Perhaps the world would have poisoned itself in an orgy of industrial development. So the commissioners assumed the worst – global warming, rising seas, changing ecologies, the usual scenarios of self-induced global catastrophe.

Imagine that survivors are starting afresh. The world is much changed. Grasslands are deserts, former deserts bloom, skyscrapers are mere stumps. Our descendants gaze on ruined cities like Celts who see nothing but ghosts among the fallen stones of Londinium. They settle in the depths of what had once been Arizona and New Mexico. All is sweet forest. Several areas seem particularly attractive, because they lack trees already. The grassland looks ideal for domestic animals, and as if by a miracle there are no natural rivals, no wild grazers and browsers. The reason there are no trees and wild animals, of course, is that radiation is leaking up from below.

## ALPHA BETA

But there is a peculiar object that gives this little group pause. It is a monolith, like the one in the film *2001: A Space Odyssey*, shall we say. It was built to last, and it has done so as well as the pyramids (which still endure, poking up through the floods of a vastly extended Mediterranean). On it are sets of pictures. Their purpose mirrors the worst and the best of a vanished civilization. Beneath the feet of the settlers, their distant ancestors tried to seal up the fuel that had once seemed a miracle, and became a curse. In their wisdom and deep concern, the ancestors wished to issue a lasting warning. The pictures clearly say: danger! Keep out!

That was the intention. The problem faced by the bureaucrats was this: how to say 'Keep Out!' in a way that could be understood by any culture, even one totally ignorant of their own past and of all previous languages?

The attempt to find a solution ballooned out, through a Human Interference Task Force, to an Office of Nuclear Waste Isolation, to the Bechtel Corporation in San Francisco, until it landed in the laps of a team of specialists, among them Thomas A. Sebeok, Emeritus Professor of Linguistics and Semiotics at Bloomington, Indiana University. His brief is summarized by the title of his final report, '*Communication Measures to Bridge Ten Millennia*', which has since achieved the status of a minor cult among those intrigued by the idea of non-verbal communication.

In it, Sebeok analyses the task: to devise a message, a code and a channel of communication that guarantees

## THE TROUBLE WITH PICTURES

both reception and understanding.

Each section of the task has its problems. Channels of communication are unreliable, because every channel is subject to the Second Law of Thermodynamics, that everything dissipates in the end. All messages decay with time and distance. A CD may last longer than a whisper or a smoke-signal, but on geological time-scales even CDs evaporate. It takes a continuous input of energy – like the building of CD cabinets and the application of cleaning devices – to keep channels of communication open and free of ‘noise’.

Then there is the code, the form in which the message is couched. Words were out, because all linguistic links would have gone. CDs might encode enough information (though Sebeok’s advice predated computerized CDs) – but who would bet on the survival of electric power, let alone computers, let alone compatible ones? No ideogram could work, because its conventional context would have vanished. A human figure holding up a forbidding hand could be seen as a ritual welcome. The American ‘OK’ sign – thumb and forefinger forming a circle – elsewhere means ‘money’ (in Japan), ‘zero’ (in France) or an obscenity (in ancient Greece).

Thirdly, reception. Any exchange of information implies an understanding between sender and receiver. And in normal exchange, the sender employs a variety of techniques to ensure understanding: gesture, repetition, synonyms and emphases. Finally, the sender usually has the

ALPHA BETA

assurance of feedback – a handshake, those little mm’s and ah’s, a nod, a glance, a thank-you note, a ‘Roger’. Sagan would have no feedback, but at least he could assume joint knowledge. Sebeok was forbidden that luxury.

Sebeok had to advise that there was no solution, no foolproof way to send a message across the gulf of time into the distant future. The only possible way forward was to build a cultural bridge across the gulf, to ensure the existence of shared knowledge. The US, he advised, should establish a committee dedicated to maintaining and passing on the warning. At first, the warning would be based on hard science. But in the event of social collapse, the message would change. The committee would become an ‘atomic priesthood’ whose members would be guardians of a tradition that would be passed on from generation to generation, evolving with time into both an aboriginal taboo and an instruction to renew the taboo in some appropriate form.

Naturally no such ‘priesthood’ has ever been established, if only because the question of nuclear waste disposal has no solution. Anyway, Sebeok knew his proposal was impractical. As he concluded, even if the message survived and was understood, ‘there is no assurance that future generations would obey the injunctions of the past’. The ‘priesthood’ might seem to be nothing more than a bunch of Jeremiahs banging on about the end of the world being nigh. Who would listen?

As for a universal script, it’s an impossibility.