

ODYSSEY

THE GLAXO WELLCOME JOURNAL OF INNOVATION IN HEALTHCARE



David Sackett

Evidence-based
medicine

Disease Management

A new concept
in managed care

Protein Folding

Molecular chaperones and
the second genetic code

Special Report

Progress in the
prevention and treatment
of infectious diseases

ANCIENT WAYS OF PREDICTING THE FUTURE

SUPERSTITION AND SCIENCE

The ancients were fascinated by the tales that entrails tell – the ‘science’ of extispicy, in which autopsies of animals were used to analyse the health of the environment and predict the future. How did these curious and complex systems of divination develop?

WHEN WE THINK OF ANCIENT Greece and Rome, we tend to think of Plato, Aristotle, and the other great classical philosophers. We think of supremacy of the intellect and the rule of reason. We don't immediately think of divination, yet divination was an important part of classical life and practised daily. No major decision of state – declaring war, for example – was made without consulting the gods through divination. Socrates consulted the oracle at Delphi, and lesser mortals used divination to help in personal undertakings from financial investment to marriage.

The best known divination system, used in Assyria, Babylonia, Greece, and Rome, is



By ROBERT TEMPLE

probably astrology, but astrology was introduced relatively late. Far older and more influential was the practice of extispicy – divination from animal entrails.

'The whole Etruscan nation has gone stark mad on the subject of entrails', said Cicero, himself an official Roman augur, in *On Divination*. Usually, lambs were sacrificed for the purpose, but oxen were sacrificed as well, particularly in Rome.

Extispicy's origins can be traced back to the Stone Age. Its widespread geographic reach and continuous use for thousands of years make it probably the main divination system ever used. Versions of extispicy still exist, in tribal societies found in Africa, New Guinea, and elsewhere.

The two main organs used in divination were the liver and the intestines. The liver of a freshly slaughtered lamb acts as a mirror. It is not surprising, then, that the ancients believed the liver's purpose was to reflect the divine rays that the gods were believed to beam at us. The liver – not the heart or the brain – was regarded as the seat of the soul.

As the gods were assumed to have foreknowledge, it was assumed that divine

rays brought intimations of the future. If you scrutinized the liver of a sacrificial animal carefully enough, the ancients believed, the liver would yield foreknowledge traces left behind by divine rays that had beamed on to it until the moment of sacrifice.

Analysis was complex. The Babylonians, for example, divided the lamb's liver into 55 separate zones. Any markings found in the various zones portended specific things.

The Greeks were less elaborate in their science of the liver. They tended to look for broader indicators such as the presence or absence of main fissures or protrusions. The most important was the 'head', or 'lobe', or 'finger' as contemporary Kosher ►

Left: Bronze mirror showing a winged Chalkas studying a sheep's liver. In ancient Etruria, priests like this divine haruspex were recruited from the gentry. In their heyday they were highly esteemed for their prophecies, although Roman author Cato wrote in the second century BC that he was unable to understand 'how a haruspex could keep from laughing, when meeting a colleague'. Museo Gregoriano Etrusco, Vaticano.

Below: The Louvre Museum in Paris houses this Roman relief of a haruspex inspecting the intestines of a bull during a religious procession called the suovetaurilia. The Romans consulted the gods on any occasion of some importance, and Etruscan priests were their preferred interpreters. The Etruscan influence in these matters persisted long after the Roman Empire was Christianized.



THE ETRUSCANS DREW CONNECTIONS BETWEEN CELESTIAL MOTIONS AND THE COMPLEX PATTERNS OF COILED INTESTINES

Jewish butchers still call it. Its absence was ominous. The head was said to have been absent just before Julius Caesar died, and Alexander the Great. The *processus pyramidalis*, to give it its anatomical name, is shaped like a protruding tetrahedron. Pythagoreans and Platonists believed that this shape represented the elemental particle of fire and was endowed with significant numerological attributes.

Scrutinizing intestines yielded mystical connections. Lamb intestines, when laid flat for inspection, form a distinctive labyrinthine spiral, which has been depicted for thousands of years as a sacred symbol on stones and clay. The pattern was associated with the orbital motions of the planets, a connection made explicit in the writings of Martianus Capella during the 5th century AD. The Etruscans drew connections between celestial motions and the complex patterns of coiled intestines. An astonishing Etruscan bronze liver model from Piacenza records planetary data on zones of the liver.

The Etruscans divided the sky into 16 regions. These are portrayed on the bronze liver as 16 consecutive squares or rectangles into which the outer rim is divided, each bearing the name of an Etruscan god. The long conical shape near the centre represents the gall bladder, at the top of which is the word 'Neth'. This was the

name of the Etruscan water god, equivalent to Poseidon or Neptune. Pliny writes that the Emperor Augustus 'had a double gall bladder' in a sacrificial victim on the day he won his famous naval victory at Actium in 21 BC over Mark Antony. This was appropriate because a naval battle was under the jurisdiction of the sea god, and the gall bladder represented the sea god's 'power of the moist', as Pliny records. The sign in the entrails was thus taken as an indication that Augustus would win.

The Etruscan bronze liver is divided into 40 separate regions or zones, each with a different significance. With 15 fewer zones than those designated by the Babylonians two thousand years earlier, the bronze liver could be seen to indicate simplification of the system over time. However, studies of the bronze liver suggest that the Etruscan system was imported from the East and owed nothing to the Greeks, being essentially a Babylonian system.

Roman divination systems derived from Etruscan ones, and for a long time Etruscans from Tuscany were employed to act as diviners in Rome.

In *The Marriage of Philology and Mercury*, Martianus Capella records enough about Etruscan astronomical and divinatory systems to enable us to interpret the bronze liver. He also describes the cosmic

The famous bronze liver in the Museo Civico in Piacenza. According to the *Etrusca Disciplina*, the age-old ritual knowledge that was passed on from father to son, the sky 'reflected' itself in the liver, which was thus an image of the universe. By dividing the liver into the same 16 regions as they did the sky, Etruscan priests divined the ways and the will of the gods.





symbolism of the spiral colon. Lamb colons are more complex than human ones. In lambs, the colon descends in centripetal coils, doubles back, then rises in centrifugal coils. When seen from the earth, planetary motions, particularly those of Mercury, involve forward motion, then an apparent turning back, then a movement forward. If charted against a star map, they resemble spirals. The ancients connected the two patterns.

Martianus describes the intestines of sacrificial animals as having seven concentric streams, like the orbits of the seven planets. (In saying this, he was preserving an ancient divinatory tradition which contradicted his own astronomical theories that the planets Mercury and Venus revolved around the Sun – a halfway stage to Copernicus.) Martianus describes the constituents of the ‘rivers’: ‘Within it, another one, like milk [...] The third one was sulphurous ...’. If the spiral colon is cut open, the contents of each successive spiral are, indeed, dramatically different in colour and material, as Martianus describes.

The spiral colon typically has seven coils, corresponding with the planets of the ancients. When Martianus called the outermost coil ‘extremely cold and sluggish’, he was also describing the planet Saturn, which was ‘sluggish’ because it took so long to complete its orbit. His description of the innermost coil is also a description of the planet Mercury: ‘hastening along at an

excessive speed, (it) frequently halted and reversed its course’.

The retrograde motions of Mercury were connected with the twist-and-return pattern of the intestinal spiral – a connection made as early as 2750 BC by the Sumerians of the Middle East, who based their Mask of Huwawa on intestinal convolutions. This mask was also meant to represent Mercury.

Divination from intestines was based upon a close examination of any arcs of the spiral which may have been inflamed by enteritis infection. When an arc of intestines is inflamed, it goes white and matches the colour of the surrounding intestinal fat, thereby becoming essentially invisible. For the purpose of counting arcs, it was disregarded, and the count of arcs thus resulted in an odd rather than an even number, which was considered unlucky.

Unexpected things come to light from entrails. Creatures which appear healthy can be seen to be diseased by examining their intestines and livers. The diseases revealed by extispicy, together with their inauspicious signs, often came from the unwholesomeness of the environment. Nomads from very early times used such indicators as cues to move on, to healthier pastures. Thus was animal autopsy used to gauge the environment and make decisions about where to live.

Using extispicy to foretell the future may not have been scientific, but using it to test the quality of the environment was. The ►

The Temple of Apollo in Delphi. Throughout Antiquity this temple, with its famous inscription ‘Gnote seauton’ (Know thyself) above the entrance, played a major role in the lives of the Greeks, and later the Romans. The latter were sceptical but nevertheless very reluctant to ignore Apollo’s pronouncements.

EXTISPICY WAS REALLY THE FREUDIANISM OF ITS DAY: A SUPERSTITIOUS DOCTRINE INCORPORATING A FEW FACTS

belief that the process could be extrapolated for divination purposes was misguided but provides us with some understanding of how this curious notion came about.

It will not have been lost on the reader that extispicy was a bizarre mixture of science and superstition. On the one hand, advanced anatomical knowledge was acquired. But on the other hand, this knowledge was harnessed to a crackpot interpretation. It goes to show how dangerous mere information can be. Without a sensible context, information on its own is useless. There is little point knowing everything there is to know about the configurations of the livers and intestines of animals if that information is only interpreted within a context of divine rays, gods

looking down from heaven, and a botched concept of cause and effect.

Extispicy was really the Freudianism of its day: a superstitious doctrine incorporating a few established facts (in the case of Freudianism, that sexuality and childhood experiences are important), strung together into a coherent pseudo-science (psychoanalysis) based upon false doctrines such as the 'Oedipus Complex'.

We are not immune in our time from unprovable 'scientific' theories which have every appearance of respectability because large numbers of people subscribe to them. Popular examples are the Copenhagen interpretation of quantum mechanics and the so-called 'Big-Bang' theory in cosmology; neither can be proved to be correct, and both are current orthodoxy simply because certain people prefer them. Fashion or the irrational prejudices of our society may cause other, equally justifiable, theories to be pushed aside. Extispicy is a historical example of this phenomenon.

Another curious example of the factual merging with the fantastic was the sort of oracular pronouncement made at Delphi and other established Greek oracle centres from Minoan times (circa 1500 BC) until the end of Greek classical civilization. Sibyls

were said to become intoxicated by emanations from heaven or from the god Apollo, or possibly from a chasm in the Earth (the story varied), and in their ravings to prophesy the future.

The French who excavated Delphi earlier in the century dug to the rock foundations under the Temple of Apollo and found that there was no chasm in the rock as the ancient account had maintained. The stories had insisted that the sibyl breathed in powerful fumes from the bowels of the Earth (where the monster Python's corpse was said to be rotting). We now know that this myth was a cover story concocted to hide the real reason for the strange smell round the temple.

It was true that the sibyl often lapsed into delirium and uttered incoherent prophesies which scribes took down and transformed into perfect hexameters. It is also true that at certain periods of Delphi's history the personnel believed these prophesies were divinely inspired. But the myth surrounding the smelly vapours was part of an elaborate fabric of pious fraud at the oracle centres, which had much to conceal.

The smell was actually that of burning drug plants and resins. It was these which intoxicated the sibyl. The plants were fairly deadly, and included henbane (*hyoscyamus*), black hellebore, white hellebore, and thorn apple (*datura*). Valerian may also have been used to induce sleep, and anyone familiar with its horrible odour will know that it really does smell of rotting flesh. The Minoans in archaic Crete had been great users of opium in connection with religious ceremonies. But the classical Greeks expanded the drug repertoire to include many hallucinogenic, poisonous, and mind-altering substances. In the Middle Ages, witches continued this tradition by rubbing ointment made of henbane and opium on their bodies to bring on visions. This recipe may be found in the records of the Inquisition.

Here again we have examples of sophisticated knowledge (in this case about hallucinogenic drugs) being harnessed for irrational uses. Granted, these plants were also used in ancient times for medicines and treating insanity, but their more unorthodox applications show how science can be put to the service of superstition. ♦



'The Sibyl of Delphi' by Ludger Ring (1496-1547) can be seen in the Louvre Museum, Paris. The Sibyl was a priestess and medium for Apollo. She was said to utter the Sun God's pronouncements, while inhaling the fumes from inner earth, where the body of the snake Python – killed by Apollo – lay decomposing.