

# THE IMAGE ON THE CLOTH

Stuart Fleming and C. McManus consider the medical implications of the Turin Shroud.

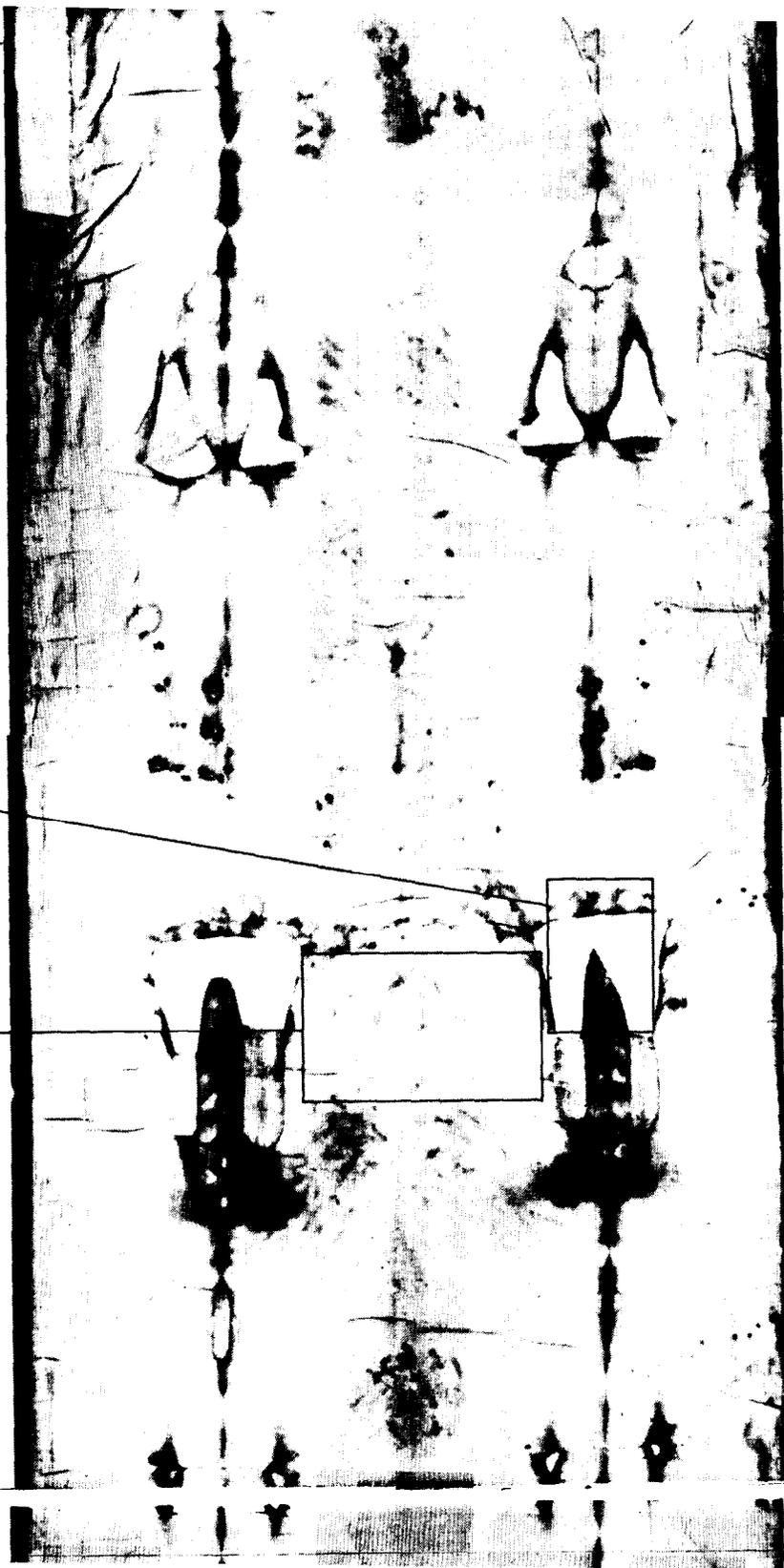
The much-publicised Turin Shroud is a strip of linen some 14 feet long bearing a rust-coloured image of a naked man with long hair and a full beard, together with what appear to be stains from a multitude of wounds on his body. For many centuries it has been alleged that the Shroud is the cloth in which Joseph of Arimathaea wrapped the body of Jesus immediately after the Crucifixion. Consequently it has become a focus of veneration at its current resting place, a silvery reliquary stored in a vault of the Royal Chapel behind the chancel of Turin's Duomo.

This alone would not make the Shroud exceptional; Italy's churches abound with relics, many attributed to the same crucial days in Christian history. But unlike the innumerable fragments of the True Cross and, indeed, similar burial cloths (such as the Shroud of Veronica), the Turin Shroud has survived so many assaults on its authenticity that, today, several aspects of the restricted technical studies so far reported support both its suggested age and purpose.

How the image might have been formed remains uncertain. Recent simulation experiments carried out by Pierluigi Bollone on behalf of the Centro Internazionale di Sindonologia of Turin have tended to confirm earlier suggestions that, in a damp environment, mixtures of aloes and myrrh (the normal Jewish anointing media) could leave fine, indelible impressions of a corpse on cloth. But relevant threads of the Shroud have yet to be analysed: perhaps that will follow the congress due to be held in Turin during September. Meanwhile, the Shroud already offers ample scope for a unique glimpse of antiquity.

## An image of crucifixion

A close look at just the wrist markings on the Shroud swiftly dispels any doubts that what we are dealing with is the result of crucifixion. A large dark mark with a pair of tails (separated by about  $10^\circ$ ) runs horizontally along each forearm, and further up the arm there are more blood traces. Clearly, in life, the wounded arms were hung at about  $60^\circ$  to the vertical. We know, from the skeletal remains of another crucified man unearthed at Jerusalem in 1968, that one method of suspending the body depended on



Spear wound  
running to  
the back

Scourge  
marks

piercing the forearm about 10 cm above the wrist's crease,

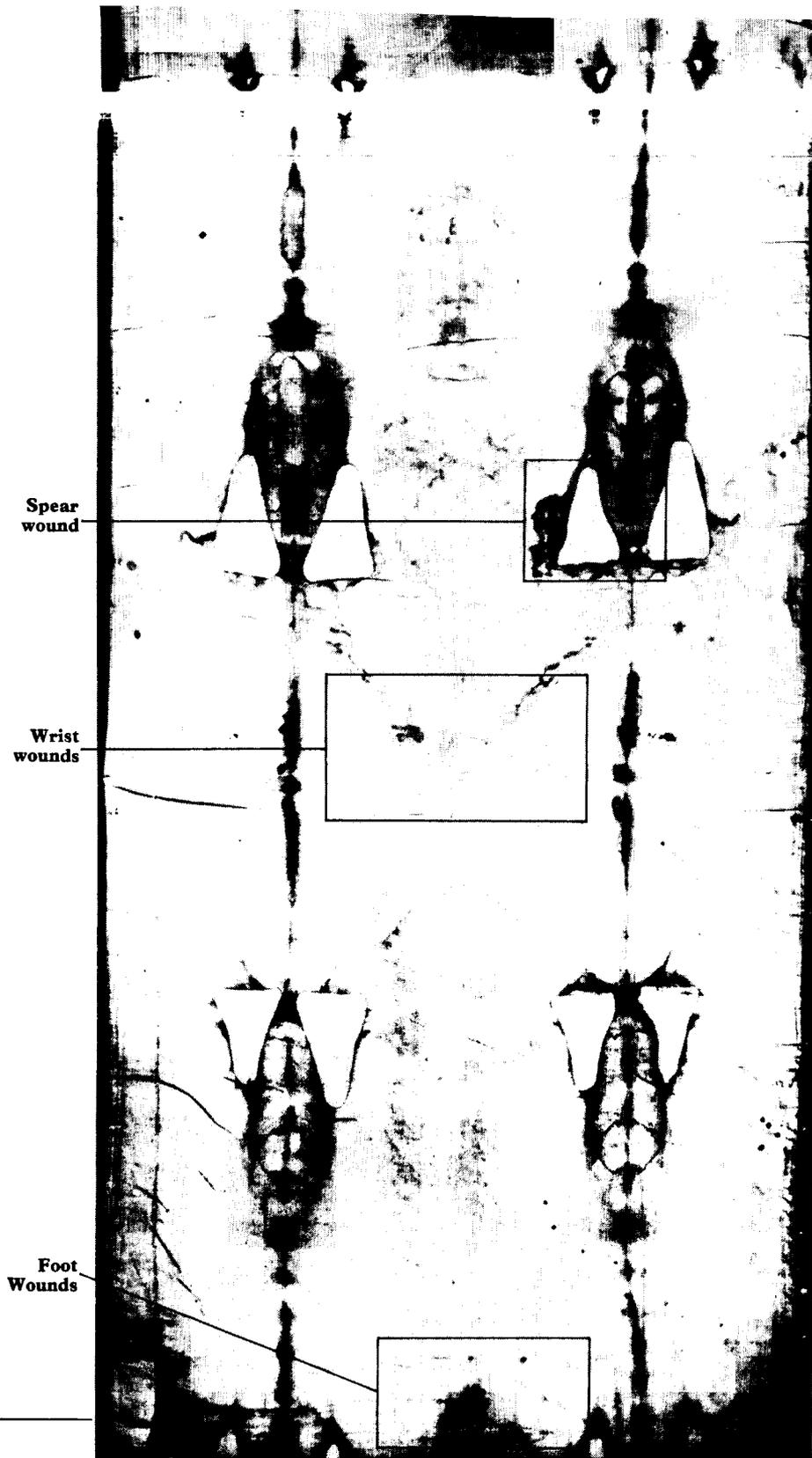
remains of another crucified man unearthed at Jerusalem in 1968, that one method of suspending the body depended on

piercing the forearm about 10 cm above the wrist's crease, so that the nail passed between the radius and the ulna. However, this disposition cannot explain the Shroud's image: the main stains are too close to the hand. It is more likely here that the nails were driven through the centre of carpal bones actually at the wrist crease. (A French surgeon, Pierre Barbet, in his *A Doctor at Calvary*, reported experiments on amputated arms confirming that such a position of nailing could support a full body weight.) What can be discounted is the notion perpetuated in so many artists' impression of the Crucifixion that the nails passed through the centre of each palm: this would cause ligament collapse between the distal ends of the knuckles within a matter of minutes. Only van Dyck, who saw the Shroud itself in 1625, ever avoided this error.

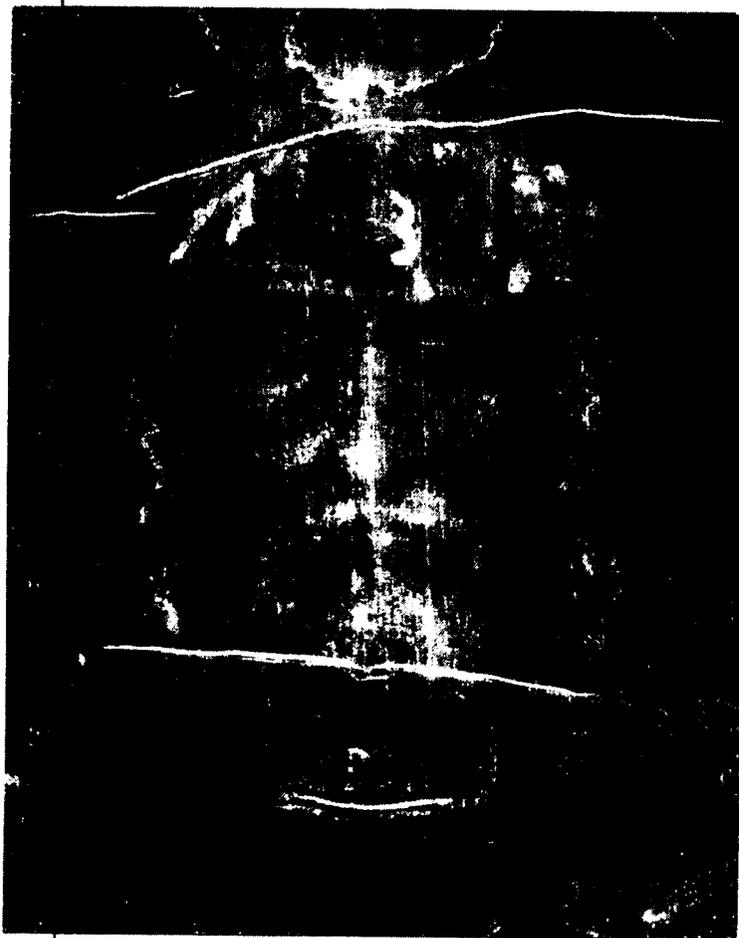
Roman crucifixion was more than a means of public execution: it was also a form of torture allowing appreciable control over how quickly the victim died. Contemporary accounts describe survival time as typically about twelve hours, though there are exceptional instances of three-day suspension, much depending upon how soon the Roman in charge of the spectacle decided enough was enough and accelerated the end in some way. Breaking the victim's legs was a common practice at this point; once the body slipped off the small *sedile* that provided support to the buttocks, death would soon follow.

The cause of death in these circumstances would be hypoxia, not (as earlier authorities have proposed) asphyxiation through a spasm of the respiratory muscles. This has been made clear in experiments on the physiological effects of suspension carried out by Professor H. Mödder (*Stimmen der Zeit*, 1949, 144, 50). He persuaded his students to be hung by their wrists and observed that within six to twelve minutes their blood pressures would halve, their pulse rates would double and they would swiftly become unconscious. This orthostatic collapse, due to pooling of blood in the legs and hence depletion of the circulation to the brain, could be completely prevented if his subjects rested their feet on the ground for twenty seconds at three minute intervals.

Thus far it is not difficult to reconstruct the likely fate of the man imprinted on the Shroud: orthostatic collapse followed minutes later by hypoxia. But the Shroud's image has yet more to say. There are scourging marks over large areas of the body, some ninety or more dumb-bell shaped marks that would match the damage done by the Roman *flagra* or *plumbatae*—a scourge of leather with metal balls at the end of each thong. (The position of the wounds implies two scourgers, one standing on each side.) Flagellation prior to crucifixion would cause severe loss of blood, and the exten-



continued



Detail of head as seen in negative, photographically. Around the scalp there are at least eight independent streams of blood running down the face (that on the left brow, in the shape of a 3 being most realistic). Scalp wounds are notorious for bleeding profusely and being difficult to stem.

sive bruising might trigger the onset of hypocoagulability. The body's fibrinogen would be used up in clot formation so that any further haemorrhage would be difficult to control; and that haemorrhage would further deplete the fibrinogen levels.

Scourging, then, would directly hasten death in crucifixion by accelerating blood loss. But scourging could also have an important indirect effect, as severe non-penetrating chest injury from any cause may cause a bloody pleural effusion. The acute embarrassment this effusion causes to respiration is sufficient in itself to induce unexpectedly rapid death.

That pleural effusion may have contributed significantly in this case is indicated by the Shroud's markings in the region of the thorax, to the right at the level of the fifth or sixth ribs. A large blood-stained patch (which seems to stem from a linear wound) with a lobed appearance of the kind that could well represent the mixing of the two fluids can be seen at that point. A simple explanation is that the lower part of the pleural cavity was breached after gravity had caused heavier red corpuscles (plus blood clots) to settle out leaving a straw-coloured fluid above it.

G. Enrie, Turin 1931



Christie's, London

*The Crucifixion, by Duccio*

### The whole truth?

An ardent believer would equate the chest wound markings with the spear thrust mentioned in Gospel accounts of the Crucifixion; he could also point to the dribbling blood stains around the hairline that are fully consistent with damage caused by a taunting crown of thorns. A sceptic might suggest that the biblical accounts of the Crucifixion were retrospectively coloured by a knowledge of the Shroud's markings.

However, one extra piece of forensic data introduced by Rodney Hoare (author of the recent book *The Testimony of the Shroud*) at last year's London Symposium on the Shroud of Turin could open up a completely fresh debate on the much more sensitive question of whether or not the Shroud documents resurrection. Hoare concluded that the variation of staining in the cloth must have been a function of the cloth's temperature, and that the only rational explanation for the evenness of staining on the Shroud is that blood was still circulating in the body adjacent to it. The legs of a cadaver cool swiftly but the buttocks and shoulder blades retain their heat much longer.

Could it be, then, that the body taken down from the Cross was in a comatose state; a body lifeless to the touch but a few minutes short of suffering hypoxia; a body which, with some outside help, could heal well enough to appear amid a flock of disciples in Galilee a month or so later? No one knows; but a lot of people care. ■

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