

## HISTORICAL PERSPECTIVES.....

### Molten gold was poured down his throat until his bowels burst

In 1599, a Spanish governor in early colonial Ecuador suffered this fate. Native Indians of the Jivaro tribe, unscrupulously taxed in their gold trade, attacked the settlement of Logrono and executed the gold hungry governor by pouring molten gold down his throat.<sup>1</sup> Pouring hot liquids or metals, such as lead or gold, into the mouth of a victim was a practice used on both sides of the Atlantic Ocean, by the Romans and the Spanish Inquisition among others.<sup>2</sup>

Several sources mention the bursting of internal organs.<sup>1-3</sup> The question remains whether this is actually the case and, also, what the cause of death would be. To investigate this, we obtained a bovine larynx from a local slaughter house (no animal was harmed or killed specifically for this purpose). After fixing the larynx in a horizontal position to a piece of wood and closing the distal end using tissue paper, 750 g of pure lead (around 450°C) was heated until melting and then poured into the larynx. Immediately, large amounts of steam appeared at both ends of the specimen, and the clot of tissue paper was expelled with force by the steam. Within 10 seconds, the lead had congealed again, completely filling the larynx (fig 1).

After cooling, cross sections of the larynx were made, and formalin fixed, paraffin wax embedded slides of the laryngeal wall were observed under the light microscope. The laryngeal mucosa was found to be totally absent, and coagulation necrosis of the underlying chondroid and striated muscle was seen at a maximum depth of 1 cm (fig 2).

Based on these findings, we suggest that the development of steam with increasing pressure might result in both heat induced and mechanical damage to distal organs, possibly leading to over inflation and rupture of these organs. Direct thermal injury to the lungs may lead to instantaneous death, as a result of acute pulmonary dysfunction and shock, as shown by Brinkmann and Puschel.<sup>4</sup> Even if this is not the case, the development of a "cast" (once the metal congeals again) would completely block the airways, thus suffocating the victim.

In conclusion, we have shown that in the execution method of pouring hot liquefied metals into the throat of a victim, death is probably mediated by the development of steam and consequent thermal injury to the airways.

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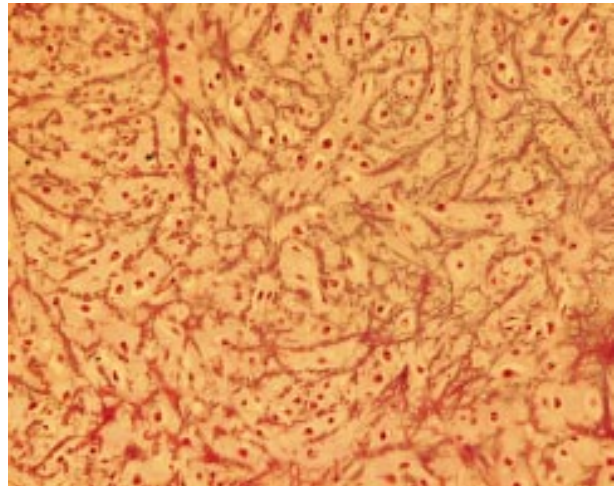
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- 3 **Hare JB.** *Hebraic literature, translations from the Talmud, midrashim and Kabbala.*
- 4 **Criminals and criminal punishments** (<http://www.sacred-texts.com/jud/hl/hl50.html>).
- 5 **Brinkmann B, Puschel K.** Heat injuries to the respiratory system. *Virchows Arch A Pathol Anat Histol* 1978;**379**:299-311.



**Figure 1** Bovine larynx after being filled by melted lead.



**Figure 2** The laryngeal mucosa was totally absent and coagulation necrosis of the underlying chondroid and striated muscle can be seen.