

THE HIDEOUS TRADE
Economic Aspects of the ‘Manufacture’ and Sale of Eunuchs*

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The proposition is now widely accepted that economics has greater relevance to human behaviour than earlier generations of economists (and non-economists) supposed. Application of basic principles concerning the maximization of benefits and minimization of costs has been extended well beyond the traditional limits. Important new insights have emerged with application to family activities such as marriage and the decision to have children, and darker areas such as crime, discrimination, and addiction. This paper brings economics into one of the darkest of all profit-making pursuits, the ‘manufacture’ and trade in eunuchs.

Eunuchs are castrated males, usually slaves operated upon during boyhood. (Boys survived the operation better than did adolescents or adults.) The major demand for slave eunuchs was as supervisors of women, especially in the harems of rulers, nobility, and the wealthy in the Ottoman Empire and its Muslim neighbours and precursors.¹ This demand was long-lasting, becoming important in the second century following the Islamic conquests of the seventh century and extending to the end of the nineteenth century.² Eunuchs were also important in the later Roman Empire, the Byzantine Empire, and in Persia, India, China, and parts of sub-Saharan Africa.³ But the focus of this paper is the economic issues involving the supply of eunuchs to the ‘Muslim Mediterranean’, defined as the Muslim or once-Muslim parts of southern Europe, North Africa, and the Near East, including all of what became the Ottoman Empire at its greatest extent. In these regions, the maintenance of large harems by the upper classes greatly stimulated demand for males who could be trusted with large numbers of nubile women.⁴

* My thanks to Stanley Engerman, H.A. Gemery, John Hunwick, and James Webb for their suggestions. The term “hideous trade” was used by Edward Burnett Tylor, the first professor of anthropology at Oxford University, in his article “Eunuch” in the eleventh edition (1910/11) of the *Encyclopædia Britannica*.

¹ The English word “eunuch” derives from the Greek ευνουχος. That Greek word is in turn a short form of οἱ τὴν εὐνήν ἐχόντες, meaning “guardians of the bed chamber”. See Liddell and Scott (1883:608).

² See Hunwick (1992:21). Hunwick’s interesting paper served as the basis for my introduction to the trade in eunuchs.

³ See Tylor (1910/11:890–891).

⁴ Some eunuchs were also active in public affairs, serving as generals, admirals, ministers, and royal officials in many parts of the world, especially in the Byzantine and Ottoman Empires. Eunuchs served widely on the staff of churches, mosques, and other religious institutions. In many areas, it was

This analysis of the production of eunuchs for Islamic markets is based on three stylized facts. First, the eunuchs were overwhelmingly 'foreigners', that is, as boys they had been acquired by capture or purchase in slave-producing areas. They were not from the territories of the 'Islamic Mediterranean' where the eunuchs were employed. The second stylized fact concerns the geographical location of castration, which almost universally occurred at great distances from the eunuchs' final markets. The third fact is the high death rate from the operation. These facts are established below.

A significant economic question arises from the stylized facts. Why in particular were the boy slaves castrated far away from the final market and then made to march long distances (many across the Sahara Desert) to arrive eventually at centres of demand such as Constantinople, Cairo, Baghdad, Beirut, Jeddah, Mecca, Medina, and Smyrna? Castration at the market would appear to have had advantages. No period of recovery from the operation would have delayed their shipment. With their physical health unimpaired, they could have made the journey in unweakened condition. The motive for gelding at the journey's end would seem strong.

Until now the explanation has been cultural and religious: Mediterranean Islam is said to have opposed any local participation in the act of castration, while still being willing to buy, sell, and use the end product. This cultural/religious explanation for decision-making concerning eunuchs has been widely accepted. The present paper provides an alternative explanation, an economic one based on death rates from castration acting as an increase in transport costs. It suggests that even had there been no Islamic cultural/religious prejudice against castration, economic reasons were fully sufficient to have caused the operation to be carried out far away from the market for final sale.

EUNUCHS WERE 'FOREIGNERS'

The trade in eunuchs to Mediterranean Islam was part of the general trade in slaves. It was geographically varied, with the sources of supply changing substantially over the

considered advantageous to employ them not only to supervise women but in positions of trust involving money, property, and power, or even just as guards and messengers, because they had no progeny to look out for. As Meillassoux (1991:189) points out, nothing that belonged to them, whether wealth, titles, or functions, could be passed on to offspring. Thus their loyalty was thought to be of a superior sort. The status and power of the Ottoman sultan's chief eunuch (the Kishlar Agha) is a theme of Ottoman history down to the nineteenth century. Eunuchs were also prized as adult soprano singers, and they served in the papal choir until the practice was halted by Pope Leo XIII in the late nineteenth century. Tylor (1910/11:890–891) gives a good short discussion, as does the article on eunuchs by Stilwell (1998:189–192). Millant wrote a book-length historical study (1908), and there is an excellent depiction of their position in the Roman Empire, east and west, in Hopkins (1978: chapter 4). Millant (especially the concluding chapter) and Hopkins both describe at some length the physical changes that accompanied castration.

centuries. But one element was unvarying: the supply generally consisted of 'foreigners'.⁵ From about the eighth century, there were three main slave-producing areas from which the boys destined to become eunuchs, as well as a much larger mass of other slaves, were obtained. These areas were the forested parts of central and eastern Europe called by Muslims the "Bilad as-Saqaliba" ("slave country"), the word *saqlab* meaning slave in Arabic (and related to the ethnic designation "Slav"); the steppes of central Asia called the "Bilad al-Atrak" ("Turks' country" or Turkestan); and eventually most important, the savanna and the fringes of the wooded territory south of the Sahara called the country of the blacks or "Bilad as-Sudan".⁶

From the eleventh century, two of these sources of supply of slaves dried up as the Slavic peoples became Christianized and no longer sold to the Muslims, and as the Turkish peoples embraced Islam and were thereby exempted from enslaving (Lombard 1975:201–202). That left sub-Saharan Africa, which remained the main source of supply for eunuchs until the end of the trade well into the nineteenth century. The eventual predominance of Africa was fully reflected by developments at the most famous of all the harems, the Ottoman sultan's Seraglio at Constantinople. N.M. Penzer states that the first use of black eunuchs in the Seraglio occurred in the fifteenth century (1936:135; Penzer gives a date of 1475). Their employment increased over the following years, until by the early part of the seventeenth century the Ottoman harem was staffed entirely by gelded Africans. Though their importation decreased greatly in

⁵ This contrasts with the situation in China where the eunuchs were almost entirely Chinese obtained locally, so meaning that the economic arguments in this paper do not apply to China. See Penzer (1936:139), and Gordon (1989:92). There were also eunuchs of local origin in the Byzantine Empire. See Ayalon (1979:67–124).

⁶ See Lombard (1975:194–202, especially page 196), who provides a valuable series of route maps. Slavic boys came from a wide belt of territory, some exported by the slave traders of the Principality of Kiev and the Samanid Principality and travelling through Greater Bulgaria, while others originated in Europe to be exported on routes through Germany, Bohemia, and France. There was a well-defined route through Lyons, to Muslim Andalusia and onward by sea to the major markets. Slaves came on other routes as well. Turkish boys arrived from Turkestan, elsewhere in central Asia, and southern Russia, often through Transoxiana with its slave markets at Samarkand and Bukhara. The African flow, which eventually supplanted the others as we shall see, came along several routes. Many Ethiopians (Ethiopia was the best-known early source in Africa) and Nubians came up the Nile or via ports such as Massawa and Suakin on the Red Sea; other east coast Africans (some from as far away as the modern southern Kenya and eastern Tanzania) travelled through Somalia and the southeastern end of the Red Sea at or near Aden, Yemen, and the island of Socotra; others came across the Sahara eastward from Baghirmi, Dongola, Darfur, Kordofan, and Sennar in present-day Chad and Sudan and then up the Nile; yet others made the northward journey across the Sahara especially to Tunis and Tripoli (and also Morocco) from source areas such as Mossi territory (present Mali), a wide band of Tuareg country (present southern Algeria and northern Niger Republic and Mali), Damagaram (present Niger Republic), the Ningi region (Nigeria) and other source areas in the central and western Sudan. A Mediterranean sea voyage ended the journey for many of these exports from Africa. The foregoing is not meant as an exhaustive list. The African portion of the trade in eunuchs is referred to in Bovill (1968:246), Fisher and Fisher (1970:102, and chapter 7), Martin (1985:54–55), Meillassoux (1991:364–365), Meinardus (1969:47–58), Miers (1975:57), Palmer (1928:108–110), Penzer (1936:139–140), and Salifou (1971:132; cited by Martin 1985:78–79).

the nineteenth century, these late imports were also almost entirely from Africa. Their employment was ended just after the turn of the twentieth century.⁷ (Most eunuchs served in less pretentious establishments, but their high price made them always a luxury item.)

EUNUCHS WERE NOT USUALLY CASTRATED AT THEIR FINAL MARKET

Throughout history, most of the boy slaves being turned into eunuchs for Islamic markets were castrated long distances away from the major demand for them at Constantinople and other metropolitan centres. They were seldom operated on at or near the market.⁸ This phenomenon demands explanation.⁹ As has already been mentioned, the explanation given heretofore for undertaking castration at or near the point where the boy slaves were captured or purchased rather than at the market is a cultural and religious one (Hunwick 1992:21). The unpleasant nature of the operation was recognized in Islamic law; according to the Prophet, "Whoever kills a slave, him will we kill. Whoever cuts off the nose of a slave, his nose will we cut off; and whoever castrates a slave, him also shall we castrate" (Hunwick 1992:21). Under the Maliki school of law, slaves had to be freed if they were mutilated.¹⁰ So, even though Muslims around the Mediterranean felt free to buy and employ eunuchs, they "were generally scrupulous about observing the prohibition on mutilation themselves" (Hunwick 1992:21).

The question of where the boy slaves were castrated is not well-studied, one reason being reticence concerning an activity that, to a large proportion of mankind,

⁷ See Toledano (1982:8–9, 1984:380–381, 1993:44), Lewis (1990:75), and Hunwick (1992:22). Toledano points out that in 1903 the Ottoman imperial harem held from 400 to 500 female slaves, supervised and guarded by 194 black African eunuchs.

⁸ As David Ayalon's authoritative article states, "the overwhelming majority of the eunuchs, like the overwhelming majority of all other slaves in Islam, had been brought over from outside the borders of the Muslim lands. Furthermore, even those people from Dar al-Harb [non-Muslim territory], who had been made eunuchs, were not usually castrated within Dar al-Islam [Muslim territory], but outside its boundaries, namely, before arriving in it" (Ayalon 1979:69–70). Gordon puts it plainly: "The unending stream of desexed boys who were walked or transported by boat or caravan from their native lands in Europe and later Africa arrived ready made in Muslim countries" (Gordon 1989:92). A warning is in order, however. Due to the distasteful nature of the operation and the widespread opposition to it, precise details concerning the geographical location of castration are sketchy (See the comment to that effect by Toledano 1984:383). A rare example of eunuch-making in Constantinople, in the Seraglio itself, is apparently referred to by the Venetian diplomat Ottaviano Bon in the first decade of the seventeenth century. See Penzer (1936:121). Millant mentions that some castrations were carried out in Turkey, but he provides no details (1908:224).

⁹ Indeed, the raising of this question of the location of castration at a conference on slavery in the Nigerian hinterland at York University, Ontario, in February of 1996 was the catalyst for the present paper.

¹⁰ Hunwick cites the Maliki sources (1992:21).

reflected discredit on the participants.¹¹ There is nonetheless abundant evidence that the castrations were usually carried out at great distances from the place of the eunuch's final sale and employment.¹² The statement is accurate for the eunuch trade both in the early period, when significant supplies were coming from Europe and Central Asia, and in the later period when the supply was mostly from Africa. As will be discussed, the operation was quite dangerous, with very high death rates especially when it was carried out by amateurs. Specialist knowledge was useful in lowering mortality and so reducing costs, which is why the act was often performed by specialists at various "castration centres" on routes utilized by slave traders. We shall also see, however, that these centres were in general located far away from the main final markets of the Muslim Mediterranean.¹³

In the earlier period, the eunuchs coming from Europe were often castrated at Prague in Bohemia and Verdun in northern France (Lombard 1975:198; Hunwick 1992:22). Other centres receiving mention are Pechina (Andalusia) and the island of Favignana just off the western coast of Sicily (Ayalon 1979:75–76).¹⁴ The central Asian supply went through a major castration centre at Khārazm (Khwarizm) near the shores of the Caspian Sea, while the supply from southern Russia was frequently castrated in Armenia. Samarkand and Bukhara in the Samanid Principality were other centres for the Russia/Central Asia trade in eunuchs.¹⁵

The later trade from Africa followed the same pattern, with centres of castration almost always located long distances from the Mediterranean Muslim markets for eunuchs. In eastern Africa, important African castration centres were in Ethiopia, at Aswan on the Egyptian border, and near Asyut in Upper Egypt.¹⁶ For Ethiopia, which furnished a considerable supply to the Mamluk Sultanate in the fourteenth century, the evidence indicates that the eunuchs were castrated before their export. A village near Hadya is mentioned as the chief castration centre for that region (Ayalon 1977: 280–281).¹⁷

¹¹ As Penzer points out, "secrecy has always surrounded the infamous trade of making eunuchs [with] consequential disinclination of those connected in any way with it to discuss the subject at all" (1936:141).

¹² A very early indication of this is found in Herodotus, who notes how the Persians castrated Greek boys captured in Ionian towns before sending them on to the king (1942:chapter 32).

¹³ I have taken the apt phrase "castration centre" from Lombard (1975), whose translator uses the term repeatedly.

¹⁴ See also Ayalon (1979:104) for a more general reference to Andalusia.

¹⁵ See Lombard (1975:197–198).

¹⁶ For this and the next paragraph see Ayalon (1977:267–295), Caillaud (1826/27:117–118), Fisher and Fisher (1970:143), Lewis (1990:76), Lombard (1975:200), and Meinardus (1969:52). Some of the places mentioned were at least nominally in Ottoman territory, though according to Toledano "in all probability, [the African eunuchs] had already been castrated by the time they reached Ottoman territory" (1984:386).

¹⁷ Ayalon states that in all of Abyssinia [Ethiopia] on the basis of the evidence he cites "there was just one place which specialized in castration" (1977:281). Ayalon does not identify the location of the

Late in the trade, the stretch of the Nile between Girga and Asyut drew considerable notice from travelers, with activity reported at or near Girga itself, at the monastery of Deir al-Jandala near Abu Tig and the town of Tahta both south of Asyut, and especially at Zawiyat al-Dayr, a predominantly Coptic village, which some authorities describe as the centre with the largest output. The Swiss scholar J.L. Burckhardt, who was in Upper Egypt and the Sudan in 1813 and 1814, states that Zawiyat al-Dayr was

The great manufactory which supplies all European, and the greater part of Asiatic Turkey with these guardians of female virtue [...]. [T]he greater number undergo the operation immediately after the arrival of the Darfour and Sennaar caravans from Siout [Asyut] [...] (Burckhardt 1819:329).¹⁸

Other reports indicate castration of boys further south at the major depots where slaves were accumulated for shipment northward down the Nile. Places mentioned include Khartoum and Gondokoro (Penzer 1936:139–140). Yet other sources indicate castration of East Africans among the Maracatos of the Somali Coast and, just across the Red Sea, in the Hijaz (present Saudi Arabia) and Yemen (Miers 1975:57; Fisher and Fisher 1970:102).

In West Africa, there were places of castration in Mossi country to the south of the Niger River bend (present Burkina Faso), in Damagaram (Niger Republic), in Borno (northeast Nigeria), and especially in Baghirmi (Chad).¹⁹ Just as in eastern Africa, depots on slave export routes were also the provenance of castrations, as for example at Marzuq and Kebabo (southern Libya) (Penzer 1936:139–140).²⁰

HIGH DEATH RATES FROM CASTRATION

A major aspect of eunuch-making is that the operation was a severe one, with accompanying high mortality. This paper posits that the high death rate was a primary determinant of the location of castration, as is explored below.

operation for eunuchs who came to the Mamluk Sultanate from non-Ethiopian sources. But he does say that apparently “most of them had been castrated outside the Mamluk Sultanate” (1977:282).

¹⁸ A.B. Clot-Bey confirms that “The village of Zawy el Dyr, near Asyut is the metropolis of the mutilators” (1840:338). For a thorough discussion, see Meinardus (1969:52), who also cites several other travelers as saying that the site of the emasculation is a village in the neighbourhood of Asyut.

¹⁹ Bovill (1968:246), Gordon (1989:92–93), Last (1967:63, 92), Fisher and Fisher (1970:146), Tremearne (1968:62). It should be noted that the substantial use of eunuchs in sub-Saharan Africa meant that in this area many travelled only short distances to their final markets. See Gordon (1989:93).

²⁰ Marzuq is a well-known oasis; Kebabo does not appear in *The Times Atlas of the World*. Times Books, Third Edition. John Bartholomew & Sons Ltd. 1977

The Severity of the Operation

Castration can be partial (removal of the testicles only or removal of the penis only) or total (removal of both). In the later period of the trade, that is, after Africa became the most important source for Mediterranean Islam, it appears that most eunuchs sold to the markets underwent total removal.²¹ This version of the operation, though considered most appropriate for slaves in constant proximity to harem members, posed a very high danger of death for two reasons. First was the extensive hemorrhaging, with the consequent possibility of almost immediate death.²² The hemorrhaging could not be stopped by traditional cauterization because that would close the urethra leading to eventual death because of inability to pass urine.²³ The second danger lay in infection of the urethra, with the formation of pus blocking it and so causing death in a few days.²⁴

Experience seemed to indicate that boys could withstand the operation better than adolescent or adult males, and the operation was therefore normally restricted to juvenile males between the ages of four and 12, with some apparent preference for boys between eight and 10.²⁵ Even so, the death rate from the operation was usually very high, as is explored below.

²¹ See Toledano (1984:382), Tremearne (1968:62), Tylor (1910/11:891), and Gordon (1989:96). In many parts of the world, partial emasculation was common however, and this practice was apparently the predominant one among the Ottoman Empire's 'white eunuchs'. Overall, removal of the testicles only may have been the most common form of the operation. See Greenidge (1958:27), and Millant (1908:217).

²² See Miers (1975:57), and her citation of Burton to Granville, 7 Feb. 1881, FOCP 4626. A detailed description is given by Millant (1908:67–72).

²³ Styptics used as substitutes for cauterization included application of hot dust, hot sand, hot tar, mule dung, paper covered with cold water, hot oil and oil mixed with clay, alum, warm honey, fresh butter, or henna powder to the wound, as well as charms and incantations. See Meinardus (1969:54), Clot-Bey (1840:338), Frank (1802:15–16), Light (1818:46), Madden (1829:13), Millant (1908:71, 225), and Penzer (1936:139–140, 143), who adds that a tube was often inserted during the healing process and then withdrawn after the critical first three days following the operation. The hope was that a usable passageway would be maintained.

²⁴ See Toledano (1984:382), and Meinardus (1969:54). Drawing from an observation by Carter Stent on Chinese eunuch-making, Penzer notes that if the object of castration could not urinate after three days during which he had been bandaged, "the passages have become swollen and nothing can save him" (1936:143).

²⁵ See Bovill (1968:246) who says the most robust of the boys and youths were preferred. Burckhardt: "The boys chosen are between the age of eight and twelve years" because the risk of fatality was much greater at a more advanced age (1819:329). Caillaud: "malheureux enfans de huit ou dix ans" (1826/27:117). Clot-Bey: "jeunes nègres de six à neuf ans" (1840:338). Frank: "les enfans de 8 à 10 ans, et jamais au-delà" (1802:15). According to Miers boys aged four to 10 were best, though men were sometimes gelded for the trade, or as punishment for crime or because it was the custom to mutilate prisoners of war (1975:57). Millant: "ce sont pour le plupart des enfans de six à douze ans" (1908:226). Schoelcher: "On choisit d'ordinaire des enfans de huit à douze ans" (1846:121). Penzer notes the added danger if the subject of the operation had reached puberty (1936:144).

Types of Evidence Concerning Mortality

There are two types of evidence indicating high death rates from total castration. One is the direct report of contemporary writers. The second is economic, involving the price differential between ordinary slaves and the eunuchs that survived the operation. The two sorts of evidence allow for a check on accuracy. Thus a few writers who maintain that death rates were exaggerated also identify price differentials that suggest a high death rate after all.

The economic argument based on price is based on the fact that the 'manufacture' of eunuchs had an opportunity cost involving the deaths following the operation. Any slave who died from the castration could have been sold unemasculated at the price of an ordinary slave. Consider the following hypothetical example. Assume that the price for an ordinary boy slave was \$10, and the death rate from castration was 90%. In that case one eunuch would have to sell for the price of ten ordinary slaves to cover the opportunity cost of the nine deaths. If 10 ordinary slaves sold for \$100, the price of the single surviving eunuch would have to be at least \$100 as well, or 10 times the price of uncastrated slaves.

Moreover, assuming first that the markets for slaves and eunuchs were reasonably competitive (excluding rents in the traffic), second that the cost of having the operation performed was low, and third that there were no subsequent costs of transport and handling above that for normal slaves, then with a given 90% death rate we would expect the price of eunuchs generally to be about ten times the price of ordinary boy slaves. Eunuchs could of course sell for more than 10 times the price of ordinary slaves if there were rents in the market or if high-cost specialized surgeons were hired for the operation or if extra transport and handling expenses were incurred. But they would not sell for less (except temporarily until the market adjusted). If the eunuch price did fall below a margin of 10 times, eunuch-makers would choose not to castrate and would sell the boys as ordinary slaves, so causing a rise in the price of eunuchs (and perhaps lowering the price of ordinary slaves although that market was huge by comparison) until a differential of 10 times was restored. The table below utilizes the same logic for other postulated death rates.

Death Rates from Castration and Predicted Price Differentials for Eunuchs	
Postulated Death Rate (Percent)	Predicted Price Differential (Eunuch Price as Multiple of Ordinary Slave Price)
90%	10x
80%	5x
70%	3.3x
60%	2.5x
50%	2x
33%	1.5x

Note: Assumes no rents in the trade, no cost of performing the operation, and no subsequent costs of transport and handling additional to those for normal slaves.

In what follows, the case will be made that considerable competition did exist in eunuch markets, that these markets were in any case contestable, with potential competition usually a possibility, and that the fees for the best available surgeons in this trade were low. Thus the chief long-run determinant of the differential between eunuch prices and normal slave prices was the death rate associated with the operation.

Death Rates: The Evidence

There is abundant evidence indicating high death rates from the operation. Some of it is buttressed by price data indicating the price differential between eunuchs and ordinary slaves at that location.²⁶ Death rates were dependent on two factors: first, the skill of the castrators in specialized establishments versus the untutored attentions of amateurs, and second, the greater chance of infection in certain climatological surroundings, particularly those of tropical Africa.

Let us begin with the summary statement in the "Encyclopedia Britannica", 13th edition: "As the larger proportion of children die after the operation [generally total removal] [...] such as recover fetch at least three or four times the ordinary price of slaves" (Tylor 1910/11:891). Interpolating from the table above, the implied death rate was 66 to 75%.²⁷

Death Rates in West Africa

Death rates could be higher even than this when the castration was carried out in sub-Saharan West and West-Central Africa, with a figure of about 90% often mentioned.²⁸

²⁶ Bearing in mind, however, Meinardus' warning that it is usually difficult to judge the reliability of the estimates (1969:55). It should also be noted that far fewer eunuch prices are available than are prices for normal slaves. Rather than being sold on the open market where prices could be readily observed, eunuchs were often sold privately in a 'house trade' with less public knowledge about their prices. See Fisher and Fisher (1970:163), and Gordon (1989:65).

²⁷ High death rates dated from antiquity. Hopkins reports a case from Rome during Justinian's reign in which 87 out of 90 boys (97%) are said to have died (Hopkins 1978:190, n. 50). I have not seen an accounting of death rates from castration in Constantinople under the Ottomans, where it was a rarity. But the Venetian observer Ottaviano Bon in the first decade of the seventeenth century spoke of the great danger of death from the operation. See Penzer (1908:121).

²⁸ Paul Lovejoy states that "Young boys suffered high rates of mortality in the production of eunuchs for the North African and Central Sudan markets, only one in ten or so surviving to supply the trade". He cites the explorer D. Denham who, writing from Borno in 1822, stated that it took 1000 boys to produce 100 eunuchs: "1.000 would not have been excessive as not more than 100 were likely to survive castration" (Lovejoy 1994:361, 370; citing Bovill 1968:553). In the 1850s, Heinrich Barth also used a figure of 90% mortality (n.d.:290), and E.W. Bovill cites an informant according to whom in 1919 it was "as good as could be expected", when of 100 males gelded at Kano (northern Nigeria) only 10 survived (Bovill 1968:246).

Even higher death rates were occasionally reported, unsurprising in tropical areas where the danger of infection of wounds was especially high.²⁹ At least one contemporary price quotation supports a figure of over 90% mortality: Turkish merchants are said to have been willing to pay 250 to 300 (Maria Theresa) dollars each for eunuchs in Borno (northeast Nigeria) at a time when the local price of young male slaves does not seem to have exceeded about 20 dollars.³⁰ Claude Meillassoux opts for a somewhat lower West African death rate of 75 to 90% (1991:189).³¹ The German explorer Nachtigal was told that the Baghirmi death rate was 70%, and the prices he provides indicate that this figure is plausible.³² (Nachtigal's observations in the Kuka market in 1870 indicate that the slave price for boys, aged 10–13, was 16 to 25 Maria Theresa dollars while the eunuch price for boys was 50 to 80 dollars. The range, two to five times, implies a death rate of 50% to 80%.)

Death Rates in Eastern Africa

Many sources indicate very high death rates from the operation in eastern Africa. Richard Millant's general figure for the Sudan and Ethiopia is 90% (1908:226).³³ Somewhat less lethality is indicated by Richard Burton, who claimed in the late nineteenth century a death rate of 75% by saying that one of four survived (n.d.:50; cited by Meinardus 1969:55). But price data given by Burton in 1881, which indicate a differential of eight times between a eunuch and an ordinary boy slave, are consonant with higher mortality of between 80% and 90% according to the table above (Miers 1975; citing Burton to Granville, 7 Feb. 1881, FOCP 4626).³⁴ A death rate of 66% is

²⁹ Zerbib writes that "28 out of 30 victims died" (1887:50). According to Miers mortality was 93% (1975:65). Tremearne claims 97% to 98% mortality in Zinder, Borno, and Baghirmi (1968:62), though Hunwick states his belief that this figure is exaggerated (see Willis 1985:31).

³⁰ For the Turkish merchants, see Bovill (1968:206); for Borno slave prices at the time, see Tambo (1976:210–217).

³¹ This estimate is based in part on Deherme, who says 80% (1908:373), and on Mercadier (1971:41) and Dakar Archives (K25:201), cited by Deherme, both of which speak of three to four children dead out of five.

³² See Fisher and Fisher (1970:146, 164). Death rates on the order of 50% to 60% are also implied by an earlier price quotation by Leo Africanus in Fez (Morocco), who noted in the early 16th century that normal slaves cost 15 to 20 ducats while eunuchs cost 40 ducats (Fisher and Fisher 1970:146, 164). (A much higher death rate in Morocco, 28 out of 30 or 93%, was recorded in one late nineteenth-century case by Cardinal Lavigerie. See Greenidge 1958:28.)

³³ An even higher death rate of 199 out of 200 (99.5%) is given by A.B. Wylde, who observed the slave trade in the eastern Sudan during the 1880s and who was for a time British consul at Jeddah. But Murray Gordon, who gives this reference (1989:95), believes that Wylde, who was active in abolitionist circles in England, exaggerated the true figure.

³⁴ Maltzan notes that because many of the castrated black boys died, the survivors were sold at twenty times their previous price. That differential suggests a death rate of well over 90% (1865:48–49; cited by Lewis 1990:134).

recorded by a number of observers for nineteenth century operations in this area.³⁵ As J.O. Hunwick points out: "At the monastery of Deir al-Jandala near Abu Tig in Upper Egypt some two to three hundred eunuchs were produced annually by monks who, despite their alleged skills, could not, apparently, prevent two out of every three operated upon from dying" (Hunwick 1992:22). High mortality is also supported by data on price differentials.³⁶

A Nineteenth-Century Episode of Lower Death Rates

Though in general high mortality characterized the 'manufacture' of eunuchs, travelers in the early nineteenth century reported that the castration centre near Asyut on the Upper Nile was registering significant reductions in deaths from the operation. The degree of mortality reduction is debatable, and the most optimistic assessment (by the Swiss Arabist J.L. Burckhardt) is most likely exaggerated. Burckhardt, who visited the area in 1813–14, drew special attention to the Coptic village and monastery of Zawiyat al-Dayr. He claimed that the monk-surgeons at this location had managed to reduce the death rate to a spectacularly low figure of only 2 to 3%. According to Burckhardt,

The operation itself, however extraordinary it may appear, very seldom proves fatal. I know certainly, that of sixty boys upon whom it was performed in the autumn of 1813, two only died: and every person whom I questioned on the subject in Siout [Asyut] assured me that even this was above the usual proportion, the deaths being seldom more than two in a hundred (Burckhardt 1819:329).³⁷

In spite of Burckhardt's assertion of certainty, his information is suspect. The extremely small mortality figure he cites was explicitly challenged a few years later in 1826 by R.R. Madden, a British doctor and member of the Royal College of Surgeons. Madden personally interviewed the priests and estimated the death rate at about 14% (1829:8).³⁸ Other travelers also challenged Burckhardt's figures.³⁹

³⁵ For example, "On a calculé que sur trois enfans, à qui en fait subir la castration, il en meurt deux pendant ou après cette opération cruelle" (Belzoni 1821:48); and estimates of 66% deaths by Schoelcher (1846:121), and Legh (1817:94). Kremer notes that "Die Mehrzahl stirbt [the majority dies] an der Operation" (1863:87). – I was led to all of these references by Meinardus (1969:55).

³⁶ Caillaud, writing of a Coptic establishment at Tahta near Asyut, gives a price multiple of about four times (1826/27:117–118), implying a death rate of over 70%, while Louis Frank, a doctor in Napoleon's army of the Nile writing in 1802, states that eunuchs were sold for double the price as other slaves (1802:13), implying a death rate of 50%.

³⁷ See Lewis (1990:76). Other mentions of lower death rates during this period include Light, according to whom "eleven only having died out of one hundred and sixty" [7%] (Light 1818:46), and Browne, who claims that mortality was "fatal only to a very small proportion of them" (Browne 1799:350). – I was originally led to these references by Meinardus (1969:55).

³⁸ His detailed figures show 13 deaths in 90 operations, or 14.4%.

³⁹ Clot-Bey used a figure of 25% (1840:338–339).

Even if Burckhardt exaggerated, however, his testimony and that of other travelers in the Asyut area at about this time indicate a significantly lower death rate from castration than the 50–90% so frequently reported elsewhere. Moreover, Burckhardt's information on prices in local markets support the claim that death rates from the operation were lower than in other hands – though not as low as indicated by his direct statement concerning mortality: “A youth on whom this operation has been successfully performed is worth one thousand piastres at Siout; he had probably cost his master, a few weeks before, about three hundred” (Burckhardt 1819:330). There were 20 piastres to the dollar at this time, so Burckhardt is saying that the price of ordinary boy slaves was \$15, while the eunuch price was \$50. Note the phrasing “a few weeks before” and the price of \$15. The “few weeks” presumably refers to cross-desert movement from the west and/or up the Nile from the south. The \$15 can only refer to a source price; it is much too low to include the transport costs to Asyut. Admittedly, there is no accurate accounting of these transport costs, but the food, capital expenses of caravans and convoys, wages for the escort, tariffs and tolls, and the death rate during the passage were all significant.⁴⁰ For example, David Tambo's work indicates that the partial desert crossing from Kano (northern Nigeria) to Marzuq (southern Libya) boosted ordinary slave prices by a minimum of 100% (Tambo 1976:208–209).⁴¹

Assuming that a price increase of at least 100% is the smallest likely markup for transport costs to Asyut, Burckhardt's numbers suggest a delivered price in Asyut of no less than \$30. In addition, he states explicitly that the Coptic monks were paid 45 to 60 piastres (that is, \$2.25 to \$3) for the operation (Burckhardt 1819:330).⁴² So the ordinary boy slave price plus the operation's cost (\$32.25 to \$33) compared to the eunuch price (\$50) reveals a price multiple for eunuchs only about 1.5 times the ordinary boy slave price. That multiple would, in the absence of rents from eunuch-making, imply a death rate of only about 33% at the highest. So both testimony on mortality and information on prices suggest that early nineteenth-century practitioners on the Upper Nile had achieved a significant decline in the mortality from castration.

⁴⁰ For an analysis of transport costs for slaves in the interior of West Africa, see Hogendorn (1996:209–222).

⁴¹ The information is based on the reports of the explorer James Richardson.

⁴² Additional cost information on the operation in early nineteenth-century Upper Egypt is available. Caillaud was told that the price of the operation carried out by Copts near Asyut was 4 to 5 dollars (Caillaud 1826/27:118). These figures refer to the price charged by specialized practitioners with, so it appears, the best safety records. In many cases, the operations were done less expertly and with no explicit cost but higher death rates by slave traders themselves.

THE ECONOMICS OF THE TRADE

The foregoing has provided evidence to support the stylized facts presented at the start of the paper: 1. Eunuchs in Mediterranean Islam were usually 'foreigners' imported from non-Muslim, or only nominally Muslim, territories. 2. The boy slaves were usually castrated at the source or at castration centres outside of Mediterranean Islam or on its verges, and not at the market. 3. Because of the severity of the operation, the mortality among recently-castrated boys was high though variable.

Based on this evidence, it is possible to advance a persuasive economic case as to why castration was not undertaken at the final market. As noted earlier, the explanation given for centuries both by contemporary travelers and historians, and still the standard reasoning, involves the cultural/religious argument that Muslims ought not to participate in the creation of eunuchs, an injunction said to be in the words of the Prophet himself. The consequences of this commandment were, however, mixed. One aspect seems to have been generally followed: Mediterranean Islam did not prey against itself, and fellow religionists were emasculated only rarely. A second aspect is that Muslims were prohibited from performing the operation. Though often winked at around the periphery of Islam, this injunction too appears usually to have been followed.⁴³ But the Prophet's words and Maliki law can be interpreted to mean that the operation was not to be carried out in Muslim territory even if performed on infidels. This part of the injunction, however, was clearly not followed in many instances. Some of the major castration centres were actually within the boundaries of the Ottoman Empire, including even the most important centres around Asyut on the upper Nile and those of Hijaz, Yemen, and Libya as well. Others, though located outside the empire, were nevertheless actually or nominally Muslim. Something beyond culture and religion must have been at work.

The missing link, not previously identified by those who have written on this trade so far as I can determine, is provided by the economics of location. There was a very strong economic reason to expect that boy slaves intended as eunuchs would be castrated near their place of origin rather than at the final market.

The reason is that if the boys had been emasculated at the market, the high mortality from the operation would have meant consequent loss of transport costs from origin to final market for all those who died. With transport costs significant and mortality high, the loss would have been substantial.

Consider the following hypothetical example involving 10 ordinary boy slaves. Assume that transport costs from origin to market raise the price of an ordinary boy slave by 100%, from \$10 to \$20. Further assume that the death rate from castration at any geographical location is 90%. If castration were undertaken at the market, 9 slaves would die from the operation after \$10 had been paid to transport each of them

⁴³ See Gordon (1989:92), and Miers (1975:57).

from origin to market. The \$90 total loss in transport costs could have been avoided completely by castrating the slaves at the origin and then shipping the single survivor to the market.

Callous as the comparison may seem, the economic principle involved is exactly the same as the one that governs the location of the smelting of a low-grade metal ore. Say copper ore contains 10% copper and 90% impurities. The economics involved would militate against locating a copper smelter at the market for copper. The smelter would instead be located at the source of the copper, thus eliminating the waste involved in transporting what will eventually be slag. The principle of 'supply orientation' in eunuch-making is similar. All other things being equal, mortality greater than some negligible level combined with positive transport costs would cause the output to be produced at the source of supply rather than at the market.

Several factors might interfere with the assumption that all other things would be equal: 1. Eunuchs might have to be warehoused during a 'conditioning' period of recovery, thus raising the cost of bringing them to market compared to the cost for ordinary slaves. 2. The transport costs involved in moving eunuchs might conceivably be higher than for ordinary slaves. 3. Castration in specialized establishments might result in a lower death rate, so meaning that the operation would not be undertaken at the source of slaves after all. Each of these propositions are examined in turn.

The Conditioning of Eunuchs

Self-evidently, the seriousness of castration would have prevented immediate departure toward the market if that involved walking. Slave dealers would certainly not want to risk losing a eunuch who had survived the operation, and any slowdown in transportation due to debility would delay the arrival of not just eunuchs, but whole caravans of slaves and merchandise. The eunuchs thus had to be in a sufficient physical state to make the journey, which involved a period of 'conditioning' with costs such as sustenance, housing, and policing.⁴⁴ Yet we have to conclude that conditioning expenses would not last long. The wound was only a flesh wound. As long as the patient survived the original trauma (which could be ascertained after as little time as three days), healing progressed as with any other fleshy part of the body.⁴⁵ Within about a month, the newly-made eunuch was ready to travel.⁴⁶ The additional cost to a slave dealer would be no more than pennies per day for food, the use of a small proportion

⁴⁴ Meillassoux notes the importance given to the 'conditioning' of eunuchs before shipping them (1991:189).

⁴⁵ See Penzer (1936:143).

⁴⁶ Light states that new eunuchs were 'cured' in one month (1818:46). Millant says five weeks (1908:226). Madden writes of a special diet low in fat and calories extending for 15 days after the operation (1829:14).

of 'warehousing' space (because slaves greatly outnumbered eunuchs), and modest policing costs (recuperating boys were surely not a great security risk). Since slave caravans would leave source areas on an infrequent schedule anyway, there may not actually have been any conditioning costs at all – the slave boys would have had to be warehoused for a time even if they had been left uncastrated.⁴⁷ Therefore it is very likely that conditioning costs, which were surely far less than actual transport costs, were sufficiently modest that they could not have made much difference in deciding the location of castration.

High Transport Costs for Eunuchs?

If eunuchs were especially costly to transport compared to ordinary slaves, that too could have altered the 'where to castrate' decision. This does not seem to have been the case, however. Contrary to an old stereotype, eunuchs were physically well able to make journeys. Thousands served in the armed forces of various states, and the Askia of Songhay had a sizeable eunuch cavalry corps (Hunwick 1985:22–23).⁴⁸ It is true that children (both the eunuchs and the non-eunuchs) up to the age of 10 or 12 were sometimes allowed to ride the camels during the desert crossing.⁴⁹ But the opportunity cost of this occupied space was likely very low. The camels carried considerable quantities of water to provide for the worst parts of the journey (Frank 1802:10). As this was consumed, otherwise unused carrying capacity was freed up. Even in cases where the newly-created eunuchs rode all the way, they were packed tightly, 12 to a camel according to Thomas Legh's account (1817:94). In general, nothing indicates that transporting eunuchs along with ordinary slaves and merchandise involved special difficulties or unusual costs (assuming, of course, that their wound was given adequate time to heal).

Specialization Lowered Death Rates

Both the testimony of observers and the evidence of where castration was accomplished indicate that mortality could be reduced when castration was carried out by specialists in dedicated establishments. In the early European manufacture of eunuchs, which as we have seen was important at Prague, Verdun, and Pechina in Andalusia, the role of expert Jewish practitioners is mentioned (Lombard 1975:198; Ayalon 1979:75).

⁴⁷ For example, Victor Schoelcher reports that large shipments of slaves arrived in the Asyut area of Upper Egypt only twice a year (1846:121), meaning that their exporters must have held the slaves for some time before shipping them.

⁴⁸ Indeed, eunuchs sometimes became great commanders noted for their hardihood. Justinian's famous general, Narses, who undertook campaigns over enormous distances, was a eunuch, and so were Admiral Cheng Ho, the greatest of Chinese explorers, and several famous Ottoman generals.

⁴⁹ For this statement see Frank (1802:10).

Meinardus' study of the predominance of Upper Egypt as a castration centre in the later period of the eunuch trade calls attention to the advantages that specialized practitioners, including particularly a number of Coptic monks, had over amateurs. Their knowledge of the exact distance to stretch the members during the operation, of the styptics best suited to stop hemorrhaging, and how to keep what remained of the urethra open with a metal rod or pipe (usually made of tin, pewter, or lead) or quill or reed, enhanced by their greater experience with the operation, contributed to their alleged superiority (Meinardus 1969:51, 54).⁵⁰ In particular, Meinardus notes that the herbal-based styptics employed by the Copt practitioners in Upper Egypt were said to be clearly superior to those available elsewhere (1969:51, 54).⁵¹ "The mortality-rate of the operations, which were performed by the Coptic priests and monks, was, indeed, significantly lower than that of the slave-traders", according to Meinardus, who adds that the skill and experience of the operators had a decided effect on the percentage of casualties (1969:51, 56).⁵² Upper Egypt had a further advantage as a site for castration in that the desert comes very close to the Nile. The very great danger of wound infection under tropical conditions was mitigated there.⁵³

The Result for the Location of the Operation

The fact of higher death rates in amateur hands than in specialized establishments together with more or less favourable environments for infection would work logically to alter the location of castration. Take the following hypothetical example: Normal boy slaves cost \$10 at their source, and transport costs (the same for ordinary slaves and eunuchs) raise this price by two times to \$20 at the final market. Mortality from the operation is 90% at the source and everywhere else except at the final market, where specialist practitioners have been able to reduce it to 50%. Castrating at the source would mean the original cost of \$10 each plus transport costs of another \$10, each would be lost on nine boys out of every 10, or a loss of \$180 subtracted from revenue. Castration at the market with 50% mortality would involve the death of only five boys in every 10. The subtraction from revenue in this case would be only \$100. Given

⁵⁰ See also Millant, who identifies the metals as tin and lead (1908:71, 225). The lead was gun-lead, obtainable from musket balls.

⁵¹ In the eighteenth and the first half of the nineteenth century, Coptic priests and monks had an outstanding reputation as knowledgeable medical practitioners. Speaking of Coptic monks at Zawiyat al-Dayr, the village near Asyut, Burckhardt states that they "were said to excel all their predecessors in dexterity" and were excellent surgeons (Burckhardt 1819:329). Browne notes how knowledge involving castration was transmitted as proprietary information from generation to generation (1799:350).

⁵² Greenidge makes the point that in the mid-twentieth century, death rates from castration are still very high when the operation is not performed by surgeons in hospitals (1958:28).

⁵³ Even so, infection could be reduced by performing the surgery at a favourable time of the year. According to Clot-Bey autumn was the preferred season (1840:338).

a competitive market for eunuchs, traders would have a clear motive to castrate at the market and those that did not would be undersold by other traders.

Now alter the hypothesis to allow for specialized establishments in better disease environments with 50% mortality (as opposed to 90% in less favourable hands) anywhere from source to destination. How would this affect the location of the operation? In this case, the motive would be to undertake it at the source because there would still be a substantial saving in transport costs (\$10 each, \$50 total) on the five in 10 who died even under specialized care. The reduction in mortality would again govern the decision as to location.

How does this prediction square with the historical record? We have seen that castration was commonly carried out far from the market but often not at the source either. Whether we speak of castration in the early period in Europe (Prague, Verdun, Pechina) or Central Asia (Khwarizm, Armenia, Samarkand, Bukhara), Africa (Ethiopia), just across the Red Sea in Yemen, etc., or during the later period in Saharan oases and especially Upper Egypt, a pattern appears to emerge. The operation was usually conducted at geographical locations far from the market, but where survivability was better than at the source. The greater survivability was apparently due to specialized knowledge and methods among more expert practitioners and in the later period of the trade to the favourable effects of desert and mountain environments that were less inductive to infection. There are good reasons to expect that practitioners would not have wanted to locate in the main source areas (Slavic woodlands, Asian steppes, West and Central African savanna, East African forest) because of perceived inferior living conditions, danger from local inhabitants and diseases, and a greater danger of infection under tropical African conditions. In general, the castration centres were in non-tropical locations of greater comfort and safety for the practitioners. But being far from the market, they continued to reap an economic advantage in that most of the transport costs would not be lost on those boys who failed to survive. For the trade in eunuchs, the economically sensible location for the operation would be as far from the market as practitioners would, or could be persuaded to, locate.⁵⁴

A Potential for Monopoly?

If the experienced operators of a single specialized castration centre were able to achieve a death rate lower than in any other, the possibility opens that monopoly or near-monopoly status could be achieved. Such a situation may have actually existed for

⁵⁴ It might be argued that trained practitioners could always be persuaded to relocate to source areas if the price for their services were high enough. But the historical record indicates that this did not usually occur. Presumably this was because of the harsh living conditions and physical danger referred to above. For one possible example, consider the obstacles that would have been faced by a Christian monk/surgeon attempting to ply his trade in the Sokoto Caliphate.

a time late in the eunuch trade, when Coptic establishments near Asyut in Upper Egypt achieved great prominence. We recall that Asyut was astride two major routes along which slaves reached Mediterranean Islam: the land and river route north from East Africa, and the desert route east from the West-Central savanna. Travelers' accounts suggest that the Asyut area was responsible for most eunuch-making during the first part of the nineteenth century. Burckhardt, as we have already seen, spoke of the area as "[t]he great manufactory which supplies all European, and the greater part of Asiatic Turkey" (1819:329). Clot-Bey used the term "metropolis of the mutilators" (1840:338), while Victor Schoelcher stated that this was the nearly exclusive source of supply (1846:121). According to Meinardus, "The Western travelers are unanimous in the descriptions that the making of eunuchs was carried out exclusively in Upper Egypt" (1969:52).⁵⁵

How are we to judge these claims? They are surely at least somewhat exaggerated because a portion of the supply of slave boys would have had to go vastly out of the way to reach Asyut. Examples include those from the more westerly part of West Africa and the East African coast. Though we cannot say that the reports of individuals coming to Mediterranean Islam along these other routes added up to a significant quantity, it is possible and even likely that they did.

Even so, there is no reason to doubt that the Asyut area of Upper Egypt achieved high prominence in eunuch-making based on an advantage in resulting mortality. That would be reason to expect monopoly rents to accrue to the skilled practitioners in that area. Thus it is interesting to note that these practitioners, who worked for fees, did not charge as much as might be expected for their services. The minimum price given by the travelers was 45 piastres, or \$2.25 (Burckhardt 1819:330), while the maximum (a few years later) was \$5 (Caillaud 1826/27:118). Net earnings were lower yet, because a tax was levied by government on the activity (Burckhardt 1819:330; Caillaud 1826/27:117; Schoelcher 1846:121).⁵⁶ There are three likely explanations for the low fees, none mutually exclusive. First, as already noted, the success in reducing mortality in the Asyut area may have been exaggerated by the travelers. Second, the Coptic monk/surgeons claimed that they were philanthropists, saving many boys from needless deaths.⁵⁷ They may have been setting their fees with an eye on charity rather than profit maximization. Finally (and more sceptically concerning the eleemosynary intent), the market for eunuch-making may have been contestable, with the relatively low fees as evidence of this. There were many Coptic monks and priests in the Asyut area and elsewhere who must have known something about the techniques used.⁵⁸ A

⁵⁵ Meinardus also cites other travelers who (less emphatically) called attention to the Asyut area as predominant in the trade.

⁵⁶ I have no information on the amount of the tax.

⁵⁷ See Meinardus (1969:51).

⁵⁸ Nor would the competitors necessarily have to be Copts. Madden notes in reference to the Asyut area that "An Arab latterly has set up in opposition" to the Copts (1829:8).

rise in fees to exploit monopoly rent might have triggered competition, and the contestability of the market may have prevented fees from rising in the first place. All three of these explanations could have exercised an independent influence at the same time. A reasonable conclusion is that for a time a privileged position in eunuch-making may have been achieved in the vicinity of Asyut, Upper Egypt. It does not, however, appear that the result was monopoly rents for the practitioners. (Nor is it likely that such rents, if they existed, could have been appropriated for long by slave traders buying low and selling high. That is because there was nothing obvious to stop any of the many traders involved from increasing the importation of boys had such rents emerged.)

The privileged position did not last long. Castration was prohibited by law in Egypt in 1841 (Abbate 1909:650; cited by Walz 1985:159).⁵⁹ After that, until the end of the trade toward the conclusion of the nineteenth century, the eunuchs were made once more in black Africa (Walz 1985:159; Gordon 1989:97). There, the higher death rates discussed earlier once again became the norm during the few remaining decades of the trade in eunuchs.⁶⁰

CONCLUSION

The eunuchs of Mediterranean Islam were 'foreigners', originally from Slavic Europe, Central Asia, and black Africa, and latterly almost entirely from black Africa. Castration at the final market was rare. A cultural and religious explanation for the rarity (in particular the Islamic sanction on the mutilation of slaves) has been standard. Such reasoning no doubt has considerable validity. But economic principles apparently played a much greater role in this decision than has previously been appreciated. Indeed the decision as to location is plain on economic grounds alone: the further from the market that castration took place, the greater the saving on transport costs that would otherwise be lost because of the high mortality involved in the trade.⁶¹ Eco-

⁵⁹ Eunuchs were, however, still being made in the Asyut area in 1845, according to Schoelcher (1846:121). The slave trade from black Africa was not abolished in Egypt until 1877, following several earlier failed attempts. See Toledano (1982:226).

⁶⁰ Though Millant mentions that special skills remained in evidence at Khartoum in the period after the Mahdi's conquest (1908:227).

⁶¹ A contrary view is voiced by Gordon: "The transport of slaves across the entire length of these [Saharan] routes, which was hazardous even for healthy slaves, posed unacceptably high risks to the ailing eunuchs who would be just recovering from the horrors of their operations. Special rest places had to be established en route to the slave markets. [The reference is to Saharan oases.] It was during the layovers at these and other designated places that the black boys were castrated" (Gordon 1989:96). I would contend, however, that a walk halfway or a quarter of the way across the Sahara would still require the good health that came with proper conditioning, and that therefore Gordon's reasoning is not persuasive. Even if Gordon were correct, however, the point would still establish the importance of mortality and transport costs in the decision-making of those who traded in eunuchs.

conomic principles were fully sufficient to prevent castration at the market without any appeal at all to Islamic strictures.⁶²

Yet economic principles also work against castration at the source of slaves if the mortality from the operation were higher there than at castration centres with specialized practitioners who would not or could not locate at the source and environments less conducive to infection. If the skills of these practitioners in preventing hemorrhaging and urethra blockage together with a reduced incidence of infection lowered the death rate, then the saving on this account might outweigh the loss of transport costs to the centre of those who died. Even if this were true, however, deaths in the hands of the most expert and successful practitioners were still significant. There would then be an economic motive to locate the castration centres as far from the market and as close to the source of slaves as practicable. By doing so both death rates and transport costs would be minimized at the same time. This is the behaviour that is reflected by the empirical record as it pertains to Mediterranean Islam. The centres for castration were located far from the final market, but neither were they usually located at the source of slaves. Often the centres were in Muslim territory. On this evidence, "the hideous trade" was moulded by economic principles that underlay the location of eunuch-making. These principles have not heretofore been acknowledged.

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⁶² Indeed it should be noted that many of the castration centres discussed here, including the early ones in Andalusia and some in Central Asia, and the later ones in Upper Egypt, Yemen, Baghirmi, and the Saharan oases, were in Islamic territory.

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