The Volume of European Spice Imports at the Beginning and End of the Fifteenth Century

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The late Professor Eliyahu Ashtor,[1] in his discussion of my estimates for European pepper and spice imports in the fifteenth century,[2] makes a number of points which call for comment. Ashtor presents new data which indicate that the spice imports of Venice's major competitors, the Genoese and the Catalans, as well as Venice's own imports of ginger from Alexandria, were significantly larger at the beginning of the fifteenth century than my estimates allowed for. Of more critical importance for quantitative assessments of the trans-Mediterranean trade, Ashtor also takes issue with the different values I adopted for the conventional weight of the Syrian and Egyptian spice bales at the beginning and end of the fifteenth century. In Ashtor's view, my estimates exaggerate the growth of the European spice trade in the fifteenth century.

The question of the weight of the various "boxes", "bales" and "bundles" in which spices were shipped to Europe is, of course, quite crucial to any attempt to gauge the volume of this trade, since it was in terms of these theoretically standardised units that almost all the statistically significant figures for imports which have come down to us were recorded. Accordingly, the following discussion is directed primarily to evaluating the evidence upon which the different conclusions of Ashtor and myself concerning these standards are based. In conclusion, a revised value for the late fifteenth century Syrian bale will be proposed, and the implications of this, and of Ashtor's new evidence concerning the volume of imports at the end of the fourteenth century, will be considered.

[1] The present paper was submitted for publication before the death of Professor Ashtor. The author deeply regrets that Professor Ashtor should not have had the opportunity to respond.

[2] C.H.H. Wake, "The Changing Pattern of Europe's Pepper and Spice Imports, ca. 1400-1700", *Journal of European Economic History* VIII, 2 (Fall, 1979), pp. 361-403; E. Ashtor, "The Volume of Mediaeval Spice Trade", *ibid.* IX, 3 (Winter, 1980), pp. 753-63. See also E. Ashtor, *Levant Trade in the Later Middle Ages,* (Princeton, N.J., 1983), p. 470, and "Recent Research on Levantine Trade", *Journal of European Economic History* XIV, 2 (Fall, 1985), pp. 383-4.

The Weight of the Bales

A number of different values have been suggested over the years for the conventional weight (in Venetian *libbre sottili*, hereafter l.s.) of the Syrian and Egyptian spice bales (see Fig. 1).[3]

Fig. 1. Suggested values (in l.s.) for the "standard bale".

	ca 1400		ca 1500	
	Syria	Egypt	Syria	Egypt
Heers	300	300	—	—
Lane	—	—	ca 400	1680
Wake	300	750	420	1680
Ashtor	300	600	300	1200

Heers's pioneering work is notable for the recognition that there was indeed a standard — a "common bale" which was employed in the packaging of a wide variety of different spices. Heers noted the 300 l.s. "weight" (*pondo*) which is referred to in Pegolotti's *Pratica della mercatura* and identified this as being a Mediterranean-wide standard for shipping spices to Europe.[4] In making this important point, however, Heers failed to notice that the *Pratica* contains references to two different standards: one for the Syrian trade, which was the 300 l.s. bale, and another for the trade with Egypt, where the bale weighed 750 l.s.

Pegolotti shows that in Syria, where pepper and spices were sold by the "Damascus cantar" of 60,000 *dirham* (185 Kg.), which was conventionally equated to 600 l.s., spices destined for the European market were, with certain exceptions, packed in half-cantar bales of 300 l.s. The exceptions were cinnamon and indigo (also powdered sugar), which were consigned in boxes weighing 375 l.s. This larger unit was a survival from an earlier period, before the Muslim

[3] See J. Heers, "Il commercio nel Mediterraneo alla fine del sec. XIV e nei primi anni del XV", *Archivio Storico Italiano* CXIII (1955), p. 183 ff., and *Le Livre de Comptes de Giovanni Piccamiglio, homme d'affaires Gènois, 1456-1459* (Paris, 1959), p. 25; F.C. Lane, "Venetian Shipping during the Commercial Revolution", *American Historical Review* XXXVIII, 2 (January, 1933), p. 228, note 31, "The Mediterranean Spice Trade: Further evidence of its Revival in the Sixteenth Century", *ibid.* XLV, 3 (April, 1940), p. 583, note 8, *Venetian Shipping and Shipbuilders of the Renaissance* (Baltimore, 1934), pp. 250-1, and *Navires et constructeurs à Venise pendant la Renaissance* (Paris, 1965), pp. 238-9; Wake, "Europe's Pepper and Spice Imports", pp. 366-7; E. Ashtor, "The Volume of Levantine Trade in the Later Middle Ages (1370-1498)", *Journal of European Economic History* IV, 3 (Winter, 1975), p. 577, "Mediaeval Spice Trade", pp. 754-5, and *Levant Trade*, p. 470.

[4] Heers, "Il commercio", p. 183, *Piccamiglio*, pp. 24-7.

conquest of the Crusader ports, when pepper, ginger, indigo and other *spezierie grosse*, as well as sugar, were all sold by the 72,000 *dirham* (228 Kg.) "cantar of Acre", which was equated to 720 lbs Genoese and 750 l.s. of Venice, and when, in consequence, the half-cantar bale weighed 375 l.s.[5]

The relatively small size of the Syrian bale, in comparison with the much larger Egyptian bale, possibly reflects the use of mules for transporting the spices from the market towns on the inland caravan routes to the ports of loading on the Syrian coast. In Egypt, on the other hand, where waterways linked the market at Cairo to the Delta ports, this constraint on the size of the bales was absent. Here the common bale was originally equal to a full camel load (*himl*) - i.e., the *sporta* ("basket") of five "spice cantars" (*cantar forfori*, "pepper cantar") which was conventionally equated to the 750 l.s. cantar of Acre. Subsequently it grew to be much larger, to the point where it became quite cumbersome and difficult to handle.

It is clear from Pegolotti's *Pratica* that pepper, which in Egypt sold by the *sporta*, as well as ginger, brazil-wood and indigo, which sold by the *cantar forfori*, were all packed in *sporta* bales of 750 l.s. for shipment to Europe in the fourteenth century.[6] Pegolotti also gives information on other items. Brazil-wood in bundles was shipped in lots of four *cantar forfori* (600 l.s.), cassia fistola in bales of two *cantar di mene*. Flax, which sold by the *cantar leuedi*, was packed

[5] F. di Balducci Pegolotti, *La pratica della mercatura*, ed A. Evans (Cambridge, Mass., 1936), pp. 63-9, 85, 90-1, 97-8, 307-13; W. Hinz, *Islamische Masse und Gewichte* (Leiden, 1955), pp. 26, 30-1. The cantar of Acre "di spezieria" was also known as "della catena". The same weight was in use at Famagusta, Beirut and Rhodes in the fourteenth century and at Aleppo in the fifteenth (Pegolotti, pp. 68, 90, 105; Hinz, p. 26). There was also a cantar of Acre "della fonda" approximately 5% lighter, representing, for pepper and ginger, the conventional nett weight (712.5 l.s.) of two 375 l.s. *pondi* of Syria and one 750 l.s. *sporta* of Egypt (see Pegolotti, pp. 63, 76. But Pegolotti's Egyptian equivalences on p. 64 are incorrect).

[6] Pegolotti, pp. 71, 307-8. See also pp. 75-6 for freight charges per *sporta*. For pepper and ginger the *sporta* bale had a gross weight of 72,000 Egyptian *dirham* (225 Kg.) which was conventionally equated to 720 lbs Genoese and 750 l.s. of Venice (see Pegolotti, pp. 67-8, 97-8). The *sporta* was also rated at 712.5 and 720 l.s. nett (Pegolotti, p. 76 gives 95 Cyprus *ruotoli*; G. Chiarini, *Questo e ellibro che tracta di mercatantie et vsanze de paesi*, (Firenze, 1481), caps cxiii c 77, gives 720 l.s.; G. di Antonio da Uzzano, *La pratica della mercatura*, pp. 109, 111 in the edition of G.F. Pagnini del Ventura, *Della Decima e di varie altre gravezze imposte dal comune di Firenze, Della moneta e della mercatura de' Fiorentini fino al secolo XVI, tomo quarto*, (Lisbona, e Lucca, 1766), reprinted Bologna 1967, gives 720 l.s. and 630 lbs Florentine), and at 700 l.s. nett-after-garbling (Chiarini, caps xlvii, c 77 gives 612.5 lbs Florentine and 666 lbs Genoese). Similarly, the *cantar forfori*, when considered as a subdivision of the *sporta* bale, was rated at 150 l.s. gross (Chiarini, cap. cxiiii), 142 and 144 l.s. nett (Pegolotti, p. 76 gives 19 Cyprus *ruotoli*, Uzzano, p. 109 gives 144 l.s. and 126 lbs Florentine), and 140 l.s. nett-after-garbling (Pegolotti, p. 74. Chiarini, cap. c 77 gives 140 l.s. and 133.33 lbs Genoese).

in bales weighing three *cantar leuedi* (615 l.s.). Cinnamon, which sold by the *mena* nett and by the *cantar gerui* gross, was evidently consigned in bales having a nett weight of two *cantar di mene* (ca 535 l.s.) and a gross weight of two *cantar gerui* (ca 635 l.s.). For sugar, which sold by the *cantar gerui*, the pack weighed two and a half *cantar gerui* gross (ca 800 l.s.).[7]

There were, then, depending firstly on the kind of merchandise and secondly on the port of loading, a number of distinct standards for the various packages in which spices were shipped to Europe. For the major items, pepper and ginger (which accounted for at least 80% of Venice's imports in the 1390s), and for at least some of the others, there were two general standards: the Syrian "common bale" of 300 l.s., and the Egyptian "common bale" of 750 l.s. In my view these standards did not change between the 1330s, when Pegolotti was gathering his information, and the early fifteenth century (after which the Egyptian bale began to increase in size). Ashtor, however, argues that the Egyptian bale was only 600 l.s. in the late fourteenth and early fifteenth centuries, and in support of this view he cites contemporary records in the State Archives at Genoa and Venice.

References to the weight of merchandise which occur in records generated by administrative action require particular elucidation, not least when they relate to customs or judicial proceedings. What sort of goods are in question? Are they the subject of litigation? Is the stated weight to be understood as meaning nominal weight, or pretended, or ascertained weight? Is it nett or gross? Ashtor does not usually supply answers to these questions. Where he does give some further information, it appears that the evidence is open to an interpretation different from the one he gives.

As evidence that the Egyptian bale weighed less than 750 l.s., Ashtor cites fifteenth-century references to a bale weighing "only 160 KG" [8] - i.e., about 530 l.s., or two *cantar di mene*, which is the standard for the cassia fistola bale and also the nett weight of the cinnamon bale. Even if the particular bales in question contained merchandise of another kind, it is apparent that what we have here is not the Egyptian common bale but a known subsidiary standard.

Ashtor also states that the Genoese customs registers for the year 1367 contain data which "point to the fact that the Egyptian *pondo* in the second half of the Fourteenth century contained 4 spice *kintars* (of 45 Kg. each)", i.e., 600 l.s.[9] Again, it does not appear that the evidence cited by Ashtor refers to the common bale. There is mention of *fassi* ("bundles") of brazil-wood weighing four *cantar forfori* (600 l.s.), which is the standard Pegolotti gives for brazil-wood in bundles. Other references are to *fardi*: a *fardo* of pepper weighing 4.2 *cantar forfori* (630 l.s.), which is two *cantar gerui* gross, equal to four *cantar*

[7] Pegolotti, pp. 70-1. See also note 36 below.
[8] Ashtor, "Mediaeval Spice Trade", p. 755.
[9] *Ibid.* p. 754.
[10] See Ashtor, "Levantine Trade", p. 578 and note 22.

forfori nett (600 l.s.); two *fardi* of ginger averaging 3.55 *cantar forfori* (532 l.s.), which is two *cantar di mene* each; and a *fardo* of cinnamon weighing 3.25 *cantar forfori* (487 l.s.), which looks like the nett weight of a *fardo* weighing 600 l.s. gross.[10] These examples do not demonstrate that the Egyptian common bale was 600 l.s. in the 1360s. What they do show — and this is certainly an important point to be made — is that, on occasion, the Genoese imported spices in packages (here distinguished as *fardi*) which were smaller than the standard *pondo* for the item in question. This practice may have been quite common among merchants importing in relatively small quantities at Genoa and elsewhere.

Ashtor's evidence is also significant for suggesting a further possibility which has not previously been considered. It has previously been assumed that imports from Egypt of the various minor spices for which Pegolotti does not specify a bale size were packed to the standard of the common bale of five *cantar forfori* (750 l.s.), although they were mostly sold by multiples of the *mena*. This assumption may be incorrect. It may be that Moluccan spices and other *spezierie sottili* which were sold by the *mena* (and which made up only a fraction of the total trade) were packed in bales with a gross weight expressed in terms of the *cantar di mene*. In this case a bale weighing two *cantar di mene* (535 l.s.) — Ashtor's 160 Kg. bale — is a likely possibility.[11] Ashtor's data are therefore of considerable interest, but they do not prove that the common bale of the Egyptian trade, which weighed 750 l.s. in the 1330s, and which grew to be much larger in the fifteenth century, was reduced to 600 l.s. in the intervening period.

Turning now to the Venetian evidence, Ashtor argues, from the evidence of numerous judicial documents, that the Syrian bale remained unchanged at 300 l.s. throughout the fifteenth century, and that in consequence the weight of the Egyptian bale may be deduced from ratios mentioned in other Venetian sources: two Syrian bales to one of Egypt in the 1420s and four to one in the 1460s. On this view, the Egyptian bale must have been 600 l.s. in the first half of the fifteenth century and 1200 l.s. thereafter.[12] This is the reverse of the line of reasoning — equally mistaken, I now believe — followed by F.C. Lane and by myself, which sought to derive the weight of the late fifteenth-century Syrian bale from evidence concerning the Egyptian bale.

On several occasions during the fifteenth century the Venetian authorities stipulated a particular ratio for the two bales. Ashtor cites Venetian Senate decrees of 1427 and 1430 which rated the Egyptian bale as the equivalent of two Syrian bales.[13] It is important to recognise that this was, in fact, an ancient

[11] Indicative of a bale based on the *mena* system for *spezierie sottili*, Pegolotti, p. 76, Chiarini, caps cxiiii, cli, and Uzzano, pp. 109, 112, give what is evidently a nett value (250 l.s.) for the *cantar di mena* of 267 l.s., Pegolotti, p. 74. See notes 6 above and 15 and 36 below for similar nett values for the *cantar forfori* and *cantar gerui* treated as subdivisions of a *sporta*.

[12] Ashtor, "Mediaeval Spice Trade", p. 755, "Levantine Trade", pp. 576-7.

[13] Ashtor, "Mediaeval Spice Trade", p. 755.

formula which dates from the time, more than a hundred years earlier, when the Syrian bale weighed 375 l.s. At that time the 2:1 ratio held unequivocally. By Pegolotti's day this was no longer true, since the common bale of Syria was now 300 l.s. At the same time, however, as we have seen, the older 375 l.s. bale was still in use for cinnamon, indigo, and powdered sugar. In addition, cotton was shipped in bales of 380 l.s. and wax in packages weighing 395 l.s. (375 lbs Genoese).[14] Moreover, there was also the Egyptian subsidiary standard of 600 l.s. for brazil-wood (in bundles), as well as other Egyptian standards for cinnamon and flax which were close to 600 l.s. Thus, although the 2:1 ratio no longer held between the two common bales of Egypt and Syria, it still did apply in a more limited way between the common bale in each place and certain subsidiary standards in the other.

Ashtor sees in the Senate decrees of 1427 and 1430 evidence that the Egyptian common bale was 600 l.s. This would mean that pepper was sold by the *sporta* of 750 l.s. but packed for consignment in bales weighing only 600 l.s. This does not seem at all likely, especially in view of the fact that it requires the bale to have shrunk from 750 to 600 l.s. in the fourteenth century and then to have doubled in size by the middle of the fifteenth century. Against the view which Ashtor advances at this point, we have the one piece of direct evidence, not noticed by Ashtor, which clearly specifies an actual weight — not merely a ratio — for the Egyptian bale in the early fifteenth century. In 1450 the Venetian Senate discussed a proposal that the Alexandrian "spice bale", which had lately grown to 1000-1500 l.s., *and which formerly weighed about 720 l.s.*,[15] should not be permitted to exceed one *sporta*.[16] Other sources tend to corroborate this identification of the *pondo* with the *sporta*. In particular, in documents dealing with Venetian pepper imports for the year 1399, an amount of 2100 *pondi* in one list is matched by 2100 *sporte* in another.[17]

[14] Heers, "Il commercio", pp. 183-4, Pegolotti, pp. 67-8, 311, 313. Heers gives 95 Kg. (314 l.s.) for the sack of cotton, but from his own evidence this should be ca 385 l.s., i.e., the half-cantar *pondo* implied by Pegolotti's 760-775 l.s. value for the cotton cantar at Acre in the Christian period.

[15] 720 l.s. was a conventional nett value for the 750 l.s. *sporta*. See note 6 above. See also B. de Pasi, *Tariffa de pesi e mesure correspondenti dal Leuante al Ponēte* (Venetia, 1521), 6v-7r, where 720 and 700 l.s. (nett and nett-after-garbling values) are given as equivalences employed in Cairo and Alexandria, respectively, for the *sporta* and 144 and 140 l.s. for the *cantar forfori*.

[16] Lane, *Venetian Shipping*, p. 250; *Navires*.

[17] *See* Ashtor, "Levantine Trade", p. 576, and note the doubt (which I discount in light of other evidence) whether the two lists do match. See also E. Ashtor, "Spice Prices in the Near East in the 15th Century", *Journal of the Royal Asiatic Society* (1976), p. 37, note 36 referring to the second item of 1426 in Table 1, p. 28 (where *pondo* = *sporta* is surely correct in the context or there would be no dispute over the price) and compare the prices for 1426 and 1427 on p. 28 in the same work.

To return to the Senate decrees of 1427 and 1430, these surely represent an early attempt on the part of the Venetian authorities to check the growth in the size of the Egyptian bale. That the Senate had recourse to an old and ambiguous formula, which, while still not completely superseded, nevertheless no longer represented the true relationship between the common bales, may be taken as a reflection of the ability of the importers to block moves which they considered inimical to their own interests. When the question of restricting the size of the Egyptian bale was again raised in 1450 — by which time the double *sporta* bale of 1500 l.s. was well established — the Senate once more shied away from specifying an actual weight. The proposal that the bale should not exceed one *sporta* was voted down. Eventually (in 1467) a new ratio of 4:1 was agreed to, and on this basis charges were levied at the rate of two ducats and half a ducat on bales imported from Egypt and Syria respectively.[18]

Ashtor certainly gives reason to suspect that Venetian officials may have wished to peg the Egyptian bale at 1200 l.s. This value occurs in judicial records from the second half of the century. Yet the evidence is inconsistent and conflicting. The Venetian Senate affirmed the 4:1 ratio in 1467, which means, according to Ashtor, that the Egyptian bale must have been 1200 l.s. But judicial and customs records of 1469, 1475, 1483 and 1485, which Ashtor also cites, give 1000 Egyptian *ratl* — i.e., 1500 l.s., the two *sporta* bale equal to four "old" Syrian bales of 375 l.s. — as the weight of Egyptian bales. Again, in 1487, the same year in which the Senate re-affirmed the 4:1 ratio, and also in 1485, 1486, and 1488, Venetian customs registers record 1200 *ratl*, i.e., 1800 l.s. or 540 Kg. (not 450 Kg., as Ashtor states) which is well above my own figure of 506 Kg. (1680 l.s.) which Ashtor considers to be much too high for the Egyptian bale.[19]

There is yet more telling evidence against the view that the Egyptian bale weighed no more than 1200 l.s. in the second half of the fifteenth century. Lane has details of a consignment of 50 bales sent from Alexandria to Venice in 1497 in which the bales (weighing between 1540 and 1944 l.s.) averaged 1728 l.s.[20] Lane also has a cargo list from the 1560s which includes 478 bales (*colli*) of pepper and ginger with an average weight of at least 1656 l.s.[21], and another list in which the weight of 7448 *colli e nichesse* of pepper (*nichesse* being smaller than *colli*) is given as 69,704 cantars (*cantar forfori*) — thus an average of 1404 l.s. for the 7448 units of different size.[22] There is also the statement of the diarist Sanuto that the Egyptian bale was reckoned at 10 Portuguese quintals.[23] At 168 l.s. to the

[18] LANE, *Venetian Shipping*, p. 251; *Navires*, p. 238.

[19] ASHTOR, "Mediaeval Spice Trade", p. 755.

[20] LANE, *Navires*, p. 238.

[21] Assuming the 478 *colli* contained all the pepper and all the *belledi* and *sorati* ginger. If other items were also in *colli* the average would be higher. See Lane, "Mediterranean Spice Trade", p. 583, note 8.

[22] LANE, *Navires*, p. 238.

[23] *I Diarii di Marino Sanuto*, ed R. FULIN and others (Venezia, 1879-1903), XVII, col. 191.

quintal (also given in Sanuto's diary and by Ca Masser [24]), this puts the Egyptian bale at 1680 l.s. (506 Kg.), the value which, following Lane, I have adopted.[25] None of this evidence is considered by Ashtor. Moreover, when Ashtor does refer to Lane's value for the Egyptian bale he is mistaken. Lane's value is not 1120 *libbre sottili*, as Ashtor persistently states,[26] but 1120 *lbs English*, i.e., 1680 l.s.[27]

Ashtor's contention that the Egyptian bale weighed 600 l.s. at the beginning of the fifteenth century and 1200 l.s. at the end cannot, in my view, be sustained. The Syrian bale is another matter. The evidence which Ashtor marshalls effectively undermines my earlier view that the Syrian bale weighed 420 l.s. in the late fifteenth century, as well as Lane's that it was about 400 l.s. However, it will be argued below that Ashtor's conclusion concerning the 300 l.s. standard should also be qualified.

In view of the great increase in the size of the Egyptian bale in the fifteenth century, one might expect the same considerations of commercial advantage to operate to bring about an increase in the size of the Syrian bale. There is, in fact, evidence of an upward adjustment in some of the *subsidiary* Syrian standards. In 1428 the Venetian Senate recognised an increase in the weight of a Damascus standard for the cotton bale from ca 385 l.s. to 400 l.s. (one *carica*);[28] by the end of the century the Syrian silk bale was also reckoned at 400 l.s.[29] Nevertheless, these examples are not (as Lane was inclined to believe) [30] good evidence that the common bale weighed as much as 400 l.s., especially in view of Ashtor's evidence. Ashtor cites references in Venetian records to Syrian *colli* of around 50 Syrian *ratl* (300 l.s.) which strongly suggest that this was still the standard for the common bale during the latter half of the fifteenth century.[31]

While this might appear to be conclusive, there is evidence from another quarter which throws a different light on the matter. The assumption has been that the weights recorded in the Venetian documents refer to the gross weight of the bales. Examination of the *Tariffa de pesi* of Bartolommeo Pasi,[32] however,

[24] Sanuto, V, 133; "Relazione de Lunardo da Cha' Masser", *Archivio Storico Italiano*, II, p. Appendice (Firenze, 1845), p. 29.

[25] 1680 l.s. represents, for the bulk of spice imports, a nett weight of four Venetian *carica* (1600 l.s.). See Wake, "Europe's Pepper and Spice Imports", p. 367.

[26] See, e.g., E. Ashtor, "The Venetian Supremacy in Levantine Trade: Monopoly or Pre-Colonialism?", *Journal of European Economic History* III, 1 (Spring, 1974), p. 40, note 153, and "Spice Prices", p. 27 (see also p. 37, note 17, where Lane's value for the Syrian bale of 290 lbs English is incorrectly given as 290 *libbre sottili*).

[27] Lane, *Venetian Shipping*, p. 250; *Navires*, p. 238; "Mediterranean Spice Trade", p. 583, note 8; "Venetian Shipping", p. 228, note 31.

[28] Lane, *Venetian Shipping*, p. 251; *Navires*, p. 239, and see note 14 above.

[29] See Sanuto, vol. XVII, p. 191.

[30] Lane, *Venetian Shipping*, pp. 250-1; *Navires*, pp. 238-9.

[31] Ashtor, "Medieval Spice Trade", p. 754; "Levantine Trade", p. 575.

[32] B. Pasi, *Tariffa de pexi e mesure. Con gratia et privilegio* (Venezia, 1503). Previous and following references are to the paginated edition of 1521 (see note 15 above).

gives reason to believe that, by the end of the fifteenth century, 300 l.s. had come to represent not the gross weight but the nominal *nett* weight of the standard bale.

Pasi's *Tariffa* gives garbling allowances for spices sold by the cantar in the Damascus market.[33] In most cases this was "5 per 105 per cantar", i.e., 105 *ratl* nett, ungarbled, was equated to one cantar (100 *ratl*) garbled. The exceptions to this general rule were pepper, which, when sold garbled, had a purely nominal tare for good measure, and cinnamon and indigo, for which an additional allowance was made for the inner wrapping which was not removed before the weighing. This information alone does not get us very far. However, Pasi has a second table in which the tare for each item is given as so many *ratl* per *sacco*.[34] The size of the tares in this second table rules out the possibility that the *sacco* was identical with a bale weighing as little as 300 l.s., or even 420 l.s. Comparison of the two tables indicates that for each item the *sacco* was meant to have a nett weight (after garbling) of one cantar. This can be most clearly demonstrated in the case of cinnamon. In the first table the tare for cinnamon is given as "5 per 105", plus 15 *ratl* (approximately) for the inner packing. In the second table, which includes the allowance for the outer packing, the tare is given as 25 *ratl* per *sacco*. Comparing the information in the two tables it becomes evident that the cinnamon *sacco* was reckoned to weigh one Damascus cantar (600 l.s.) nett and one cantar of Acre (750 l.s.) gross. For cinnamon, therefore, the *sacco* — which was the unit of packaging for transport along the inland camel routes — was equal to two "bales" (for cinnamon, of course, these were actually boxes) of 375 l.s., which, as we have seen, was the standard *pondo* for consigning cinnamon to Europe throughout the preceding two centuries. For most other items Pasi's tables indicate that the the gross weight of the sacco was either 720 l.s. or around 700 l.s., the nett weight in every case being nominally 600 l.s.

Pasi's *Tariffa* and Pegolotti's *Pratica* show that the standards employed in the Syrian spice trade underwent two major changes between the thirteenth and late fifteenth centuries, and that these changes also had consequences for the way in which spices were packed for consignment to Europe. In the thirteenth century, when *spezierie grosse* sold by the cantar of Acre, the half-cantar common bale had a conventional gross weight of 375 l.s., which meant (assuming the same tares as in Pegolotti's day) a nett weight of around 350-360 l.s. for the most common items. As we have seen, the 750 l.s. cantar of Acre was replaced by the 600 l.s. Damascus cantar after the fall of the Crusader towns, and in consequence the half-cantar bale was reduced in weight to 300 l.s.

The second major change, which presumably took place some time during the fifteenth century, was the change in the market standard at Damascus from a gross weight of 600 l.s. to a nett weight of 600 l.s., with the consequence that the half-cantar bale changed from 300 l.s. gross to 300 l.s. nett. For most items this

[33] Pasi, *Tariffa*, 76r-v.
[34] *Ibid.* 78v-79v.

will have meant an increase in the nominal gross weight of the bale to around 350-360 l.s. (actually closer to 355-367 l.s.),[35] the major exception being pepper, which, when sold garbled, was rated at 642 l.s. gross per *sacco*, to give a half-cantar bale of about 320 l.s. gross. For cinnamon, of course, the bale remained unchanged at 375 l.s. gross (half a cantar of Acre) and 300 l.s. nett (half a cantar of Damascus).

This concern with nett rather than gross weight is also seen in the Egyptian trade. Even though there was no comparable shift from gross to nett in the standard for the "load" in the Cairo market (the *himl* or *sporta*), it was nevertheless common practice, not only in Pasi's day but much earlier, for Europeans to make their calculations in terms of the nett value of the gross weight. This is clearly reflected in the commercial handbooks of Uzzano and Chiarini, as well as in Pasi's *Tariffa*, all of which give only nett values for the Egyptian *sporta* of 750 l.s. gross.[36] Similarly, it is also noteworthy that the rationale for the late fifteenth century bale of 1680 l.s. (or thereabouts) was that this represented, for the major items, a convenient conventional nett weight, i.e. 1600 l.s. or four *carica* of Venice.[37]

The revised values which are now proposed for the Syrian bale are presented with the previously determined values for the Egyptian bale in Fig. 2.

Fig. 2. Revised values (in l.s.) for the "common bale" and subsidiary standards of Egypt and Syria.

	ca 1400		ca 1500	
	Syria	Egypt	Syria	Egypt
Pepper	300	750	320	1680
Ginger	300	759	350	1680
Cinnamon	375	635	375	1680
Moluccan spices	300	750 (?535)	355	1680
Spez. Sotilli	300	750 (?535)	355-360	1680

A degree of uncertainty still surrounds some of these values. There is also the question how closely practice approximated to theory in the application of conventional standards to the actual packaging of spices for consignment to Europe in the galleys of the Venetians and others. It should be emphasised,

[33] Pasi, *Tariffa*, 76r-v.

[34] *Ibid.* 78v-79v.

[35] Thereby giving substance to the 4:1 ratio in mid-century, when the Egyptian bale was 1500 l.s.

[36] See notes 6 and 15 above. Note also that Chiarini (caps c 77 & cxiiii) also gives both gross and nett values for the *cantar gerui*: 318 l.s. for the standard, and for sugar 288-300 l.s., which latter relates to a 2½ *cantar gerui* sugar *sporta* (see Pegolotti, p. 71) weighing ca 800 l.s. gross and 720-750 l.s. nett.

[37] Wake, "Europe's Pepper and Spice Imports", p. 367.

therefore, that the conclusions which are presented here are, in some cases, tentative and may need to be modified in the light of new evidence.

The Volume of the Trade

In "Europe's Pepper and Spice Imports" I calculated that Venice's annual pepper import from Egypt and Syria averaged about 1.85 million l.s. (558 tonnes) in the six years 1394-96, 1399, 1404 and 1405. In the light of Ashtor's amplifications and corrections to the original figures, I would raise this to about 2.02 million l.s. (610 tonnes).[38] If we include the Romania, Venice's total imports come to about 630 tonnes. (See Table 1).

With regard to the Genoese and Catalan trade, the point of my very tentative estimates was to suggest that both the total of European pepper imports and the share held by Venice's rivals were significantly greater than previously thought. Ashtor's new evidence strengthens this conclusion. Whereas I estimated Europe's total imports at probably 830 to 900 tonnes, with the Genoese and Catalans accounting for around 250 to 320 tonnes, Ashtor now puts the share of the Genoese and Catalans at around 400 tonnes.[39] Even this figure may be considered on the low side. Europe's pepper imports must have exceeded 1000 tonnes a year at this time, with the Venetians' share amounting to no more than about 60% of the total — a much smaller proportion than was once thought to have been the case.

Ashtor greatly improves on Heers's figures for Venice's ginger trade with data which raise total imports from Alexandria in the five years 1394-96, 1399 and 1404 from 791 to 1159 bales.[40] Accordingly, my previous estimates should be revised upwards: to about 50 tonnes for Venice's ginger imports from Egypt; to 135 tonnes for Venice's total ginger imports;[41] and to about 220 tonnes for Venice's total spice imports (excluding pepper) from Syria, Egypt and the

[38] Although his own analysis (rating the Egyptian bale at 600 l.s.) should give an average of 536 tonnes, Ashtor maintains his earlier view that imports in these years were exceptional and "not typical of the Levantine trade in the period". He therefore puts Venice's imports in "normal years" at no more than 1500-2000 *sporte* or 337-450 tonnes ("Levantine Trade", pp. 582-4, 607-8; "Mediaeval Spice Trade", pp. 756-7; *Levant Trade*, p. 470). However, it is Venice's total imports from all sources that we wish to determine here. Since the increase in imports from Syria and Egypt reflects the decline in imports from the Black Sea, it is preferable to accept the available figures as an index of the volume of Venice's *total* imports, whatever their relation to the "normal" level of Venice's *Levantine* imports at some other time.

[39] Ashtor, "Mediaeval Spice Trade", p. 762.

[40] *Ibid.* p. 758. Ashtor's total of 1328 bales includes 372 *cantar forfori* mistakenly counted as bales (see Ashtor, métaux précieux, p. 120). The 1395 Beirut figures for bales and *kintar* should also be transposed.

[41] Ashtor's figure is 128 tonnes; in "normal" years, he suggests, imports were no more than 2000-2300 spice kintars, i.e., 90-104 tonnes (*ibid.* p. 759 and see note 38 above. In *Levant Trade*, p. 470, Ashtor rounds this down to 2000 kintars).

Table 1

VENETIAN GALLEY IMPORTS 1394-1405 (by bales and in l.s.)

	1394	1395	1396	1397	1399	1404	1405	Annual Average bales	Annual Average l.s.	Total l.s.
From Alexandria										
(1) Pepper	2,837	2,100	1,926		2,100	1,799		10,762	8,071,500	1,614,300
(2) Ginger	210	190	220		204	336		1,160	870,000	174,000
(3) Cinnamon	—	130	35		—	(3)		168	106,176	21,235
(4) Moluccan Spices	11	—	(2)		(2)	(—)		15	11,250	2,250
(5) Other Spices	1	94	(26)		(36)	(2)		159	119,250	23,850
(2)-(5) Total Spices										221,335
(1)-(5) Grand Total										1,835,635
From Beirut										
(1) Pepper	1,912	2,000	1,430		375	1,724	844	8,285	2,485,500	414,250
(2) Ginger	316	646	309		2,419	920	823	5,433	1,629,900	271,650
(3) Cinnamon	97	280	—		277	14	61	729	273,375	45,562
(4) Moluccan Spices	53	—	53		1,080	194	161	1,541	462,300	77,050
(5) Other Spices	200	—	(161)		150	296	268	1,075	334,350	55,725
(2)-(5) Total Spices										449,987
(1)-(5) Grand Total										864,237
From Romania										
(1) Pepper		96	—	459	377	200		1,132	339,600	67,920
(2) Ginger		—	—		45	40		85	25,500	6,375
(3) Cinnamon		—	—		—	64		64	24,000	6,000
(4) Moluccan Spices		—	—		—	—		—	—	—
(5) Other Spices		—	74		60	200		334	125,250	31,312
(2)-(5) Total Spices										43,687
(1)-(5) Grand Total										111,607

This Table is a revision of Table 1 in WARE, "Europe's Pepper and Spice Imports", p. 396.

Sources: HEERS, "Il commercio", pp. 166-9, 185-9; E. ASHTOR, "Mediaeval Spice Trade", pp. 756-9, and *Les métaux précieux et la balance des payements du Proche-Orient à la basse epoque*, (Paris, 1977), pp. 118-20; F. MELIS, *Aspetti della vita economica medievale (studi nell'Archivio Datini de Prato) I*, (Siena, 1962), p. 383. Bales of Alexandria are taken to be 750 l.s. gross, except for cinnamon (632 l.s.), and those of Beirut and Romania 300 l.s. gross, except for cinnamon and indigo (375 l.s.). The total of "Other Spices" for Beirut includes 158 *pondi* of indigo for Romania the "Other Spices" total is all indigo. The Beirut figures for 1395 are in *pondi* converted from cantars of 600 l.s. (750 l.s. for cinnamon) in the original (HEERS, "Il commercio", p. 185). The figures in parenthesis for Alexandria in 1396 and 1399 are converted from cantars of 150 and 267 l.s. (Ashtor, *métaux précieux*, pp. 119-20). Figures in parenthesis for Beirut in 1396 and Alexandria in 1404 are approximate values derived by subtraction from HEERS, "Il commercio", p. 189. The Beirut figures for 1394 include *pondi* loaded in Rhodes and Modon: 326 *pondi* of pepper, 70 of ginger, 3 of Moluccan spices, 1 of cinnamon. In addition to pepper and spices, large quantities of "associated goods" figured in the gallery imports from Beirut. Annual averages for 1395-1405 were around 8,900 l.s. of silks, 66,900 l.s. of other textiles, and 84,100 l.s. of sugar.

Table 2

VENETIAN GALLEY IMPORTS 1496-98
(by bales and in l.s.)

	From Alexandria			From Beirut		
	1496	1497	1498	1496	1497	1498
(1) Pepper	950	1,250	933	2,600	1,170	[1630]
(2) Ginger	600	776	709	550	640	
(3) Cinnamon	350	136	117	180	46	
(4) Moluccan Spices	102	126	87	352	162 + 120	
(5) Other Spices	399	112	309	470 + 148	139 + 362	
(2)-(5) TOTAL SPICES bales	1,451	1,150	1,222	1,700	1,469	[1370]
l.s.	2,437,680	1,932,000	2,052,960	605,895	520,567	
(1)-(5) GRAND TOTAL bales	2,401	2,400	2,155	4,300	2,639	3,000
l.s.	4,033,680	4,032,000	3,620,400	1,437,895	894,867	

This Table is a revision of Table 5 in WAKE, "Europe's Pepper and Spice Imports", p. 400.

Sources: I Diarii di Girolamo Priuli, Rerum Italicarum Scriptores, nuova edizione, XXIV, parte III, (Città di Castello, 1912), vol. I, ed. A. SEGRE, pp. 59-60, 73, 109; Sanuto, vol. II: 112, 128, 165-6, 172. Bales of Alexandria are taken to be 1680 l.s. Beirut bales of pepper, ginger, cinnamon, Moluccan spices, "other spices" are taken to be 320, 350, 375, 355, 355-360 l.s. respectively. An amount of 482 *colli* of "nutmeg, mace and other spices" from Beirut in 1497 is arbitrarily distributed: 120 to "Moluccan spices", 362 to "other spices". The figures in brackets are notional values derived from the ratio of pepper to spices other than pepper in imports from Beirut in 1496-7 and are for the purpose of moderating the estimate of annual average imports from Beirut.

Table 3

AVERAGE ANNUAL IMPORTS OF VENICE, in l.s., 1501/2-1505/6

	Pepper		Spices		Total	
Alexandria	445,200	92%	659,200	85%	1,104,400	88%
Beirut	36,400	8%	112,500	15%	148,900	12%
Total	481,600	100%	771,700	100%	1,253,300	100%

This Table is a revision of Fig. 2 in WAKE, "Europe's Pepper and Spice Imports", p. 373, which see for explication and sources.

Romania. (See Table 1). Europe's total spice imports (excluding pepper) must have amounted to upwards of 470 tonnes at this time, and possibly as much as 550 tonnes in view of Ashtor's evidence on the strength of the Catalan and Genoese trade, with Venice's share being no more than about 40% to 45%.[42]

Turning now to the end of the fifteenth century, Ashtor sees "major objections" to my estimates for the volume of the European pepper and spice trade at this time. They are, he maintains, too high and they exaggerate the growth of the trade over the century.[43] The main issue here is the weight of the bales. But it must also be said that Ashtor mistakenly represents both my own conclusions and Lane's.

I estimated Venice's annual pepper import in the 1490s at about 2.5 million l.s. (757 tonnes).[44] Ashtor maintains that this figure (which he gives as 780 tonnes) is too high and puts forward an estimate of 2500-3000 *sporte* (562-675 tonnes), which he states is the estimate arrived at by Lane "a long time ago".[45] In fact, Lane put Venice's total spice import (including pepper) at around 3.5 million lbs English, which agrees with my estimate, and the pepper component at 40%-50% of the total — so roughly 635 to 793 tonnes.[46] Ashtor's estimate is entirely his own, reached by reworking the import figures for 1496-98 in the light of his own lower values for the weight of the bales. In a subsequent work,[47] Ashtor puts the figure at 2500 *sporte* (562 tonnes) which is considerably less than my revised estimate, discussed below, of 700 tonnes.

Ashtor also attributes to me the "supposition" that Venice's spice trade (apart from pepper) increased nearly thirteen-fold during the fifteenth century.[48] Certainly this would be, as he says, "a great exaggeration"! However, the statement in question refers not to Venice's total spice imports (for which the figure given is 320%) but to imports of spices (excluding pepper) from Alexandria alone, where the observed increase is certainly of this order.[49] Even if Ashtor's own lower value for the Egyptian bale were accepted, the observed increase would be more than eleven-fold.

The value of 1680 l.s. for the Egyptian bale should surely stand. If Ashtor is right about the Syrian bale (that it was 300 l.s. gross), we should say that Venice's total imports of pepper and of spices other than pepper (which I formerly estimated at 2.51 and 2.77 million l.s.) were about 2.29 and 2.59 million l.s., respectively, at the close of the fifteenth century. If, on the other hand, as I have argued, the 300 l.s. standard refers to nett weight rather than gross weight at this

[42] For the Catalan and Genoese trade see WAKE, "Europe's Pepper and Spice Imports", pp. 369-71.

[43] ASHTOR, "Mediaeval Spice Trade", pp. 762-3.

[44] WAKE, "Europe's Pepper and Spice Imports", p. 371.

[45] ASHTOR, "Mediaeval Spice Trade", pp. 762-3.

[46] LANE, "Venetian Shipping", p. 228.

[47] ASHTOR, *Levant Trade*, p. 470.

[48] ASHTOR, "Mediaeval Spice Trade", p. 763.

[49] WAKE, "Europe's Pepper and Spice Imports", pp. 371-2.

time, then the figures should be set slightly higher, at 2.33 and 2.67 million l.s. (700 and 810 tonnes), respectively, in accordance with the revised figures presented in Table 2.

The revised figures in Table 1 for Venetian imports at the beginning of the fifteenth century, and in Tables 2 and 3 for imports in the years immediately before and after the opening of the sea route to India, do not substantially alter the conclusions previously presented concerning the evolution of the spice trade in the fifteenth century.[50] On the revised figures (superseded figures in parenthesis), the increase in Europe's pepper imports was probably less than 25% (45%) and possibly not much above 10% over the century, as against upwards of 155% (177%) for spices other than pepper. For Venice the figures are 10% (30%) for pepper and upwards of 270% (320%) for other spices. So far as can be judged from the available evidence, the increase in Venice's pepper imports failed to keep pace with the very moderate growth in total European imports in the period, while the increase in imports of other spices was significantly greater. The Venetians, in other words, did not quite maintain their share of the pepper trade, which probably declined to somewhat below 60% of the total, but increased substantially their share of the much more lucrative and rapidly expanding trade in spices other than pepper.

Recalculating the Venetian trade on the basis of revised values for the Syrian bale strengthens the argument in "Europe's Pepper and Spice Imports" about the relative importance of the Syrian and Egyptian branches of the Venetian spice trade at the beginning and end of the fifteenth century. At the beginning of the century Egypt was important primarily as a source of the cheaper items, pepper and ginger. Imports from Egypt then accounted for nearly 80% of Venice's total pepper import, as against less than 30% of the total of all other spices, and three quarters of this was ginger.

By the end of the fifteenth century the situation was very different. The Egyptian trade had grown to overshadow the trade with Syria completely. Egypt now supplied approximately 75% of Venice's pepper imports and 80% of imports of spices other than pepper. (Recalculating on the basis of Ashtor's value for the Syrian bale would sharpen this contrast marginally.) So far as European imports as a whole are concerned, revision of the Syrian figures makes no appreciable difference to the view previously presented of the situation at the end of the fifteenth century.[51]

[50] *Ibid.* p. 392.

[51] The revised figures do not materially affect the previous estimates (based on comparison of figures for Venetian imports in the 1490s and Venetian and Portuguese imports in the 1500s) of 1140-1270 tonnes (ca 3.8 - 4.2 million l.s.) for total European imports of pepper and 1200-1350 tonnes for total European imports of spices other than pepper (see WAKE, "Europe's Pepper and Spice Imports', pp. 371-81).