Primary Production in a Market for Luxury: the Rose-Oil Trade of Bulgaria, 1771-1941[1]

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Rose oil, or otto of roses, is the essential oil made by distilling rose flowers, then cohobating (re-distilling) the rose water produced by primary distillation. In the nineteenth century, rose oil provided an indispensable feed-stock for floral perfumery products and toiletries.[2] Until the 1970s, most rose oil in international commerce was produced in Bulgaria. Its rose gardens were located mainly in the centre of the country, in the long narrow Rose Valley which extends from east to west, enfolded by the Stara planina mountain range to the north, and its offshoot, the Sredna gora range, to the south. The zone for rose growing also extended onto the south slope of the Sredna gora, but was marginal in character, and produced inferior oil.[3] Bulgaria enjoyed a near monopoly in rose oil production because climatic and soil conditions in the rose valley were peculiarly favourable for cultivating the red *Rosa Damascena*, whose yield in oil was higher than that of alternative strains.

All Bulgaria's rose oil was exported, mainly to the then dominant centres for world perfumery, Paris, London and New York. At the height of its prosperity in 1912, the trade provided Bulgaria with 7.43 percent of its export earnings. The Bulgarian rose crop yielded but

[1] Funding for this research was kindly granted by the Carnegie Trust for the Universities of Scotland.

[2] *Perfumery and Essential Oil Record*, [*P&EOR*] 16 (1925), pp. 337-9.

[3] Christo Christoff, *L'industrie des roses en Bulgarie*. (Kazanl'k 1889), p. 9.

one 3,000 - 3,500th part of its weight in rose oil,[4] making it an extremely expensive commodity.[5] Because of its cost and the prevalence of fraudulent adulteration, the perfume trade began in the 1890s to create cheaper substitute oils. In the early days, these 'synthetics' were too impure and limited in range seriously to threaten the market for the natural product, but from about the time of World War 1, they gradually displaced natural otto in perfumery.

Over the long term, Bulgaria's rose oil output and the price of the product displayed the exaggerated cyclicality typical of agricultural primary products. For as long as the market was unaffected by 'synthetic' competition, demand for this fashionable luxury in the industrializing west more than kept pace with supply. Therefore, Bulgaria's producers, facing few external competitors, enjoyed fair prosperity and prices tended to rise, despite sharp cyclical fluctuations; but between the World Wars, competition by synthetics caused increasing instability in the market for the natural product. The purpose of this paper is to examine the impact on the industry of adulteration, the causes and effects of substitution by synthetics, and the responses that were made by producers and the state in Bulgaria.

Origins

The principal focus of flower growing for floral perfumery in the eighteenth and nineteenth centuries was the French Alpes Maritimes. For roses in particular, processing and trade were centred upon the town of Grasse.[6] In the 1860s, over a hundred businesses in this town engaged in extracting floral odours,[7] drawn from flowers grown in the region. Some flowers were pressed with lard (*enfleurage*) and those, like roses, whose odours were more robust were macerated in hot

[4] T. Bliznakov, *Rozovomaslenata ni industrija*, (Sofia 1934), p. 14.
[5] In 1996 Bulgarian rose oil was offered at $6,000 per kg., about 2/3 the price of gold. Kos'o Zarev, *Istorija na b'lgarskoto rozoproizvodstvo*, (Plovdiv 1996), p. 168.
[6] For a good contemporary description of Grasse and its floral industries, see Eleanor Hodgens, 'Grasse, the 'sweetest' town in the World', *Chautaquan*, 29 (1899), pp. 419-25.
[7] Eugene Rimmel, *Book of Perfumes*, (London 1865), p. 232.

suet. This created a pomade, which was churned with alcohol to absorb the odour into solution, making an essence or spirit.[8] Rose odour was of especial importance to the trade because it formed a key component of most floral perfumes. Maceration was costly and wasteful of raw material, but was the only way to capture the true scent of the rose. According to Arthur Young, in 1787 rose essence from Grasse was exported throughout Europe, and sold in the town at 400 livres or £17.10s 0d an ounce.[9] Since the odours of most flowers are derived from complex mixes containing relatively unstable esters, as well as the more stable alcohols, they could not be captured by the cheaper alternative of distilling. Rose odour, however, comes mainly from complex alcohols,[10] and can be distilled with less loss of quality. Nevertheless distilling roses to extract rose oil does impair their odour, partly because an important rose odour element, phenyl ethyl alcohol (p.e.a.) is water soluble, and most of it remains in the aqueous residue.[11] The Centifolia rose, the only type grown in France for perfumery, happened to have a high ester content,[12] therefore most of the French rose crop was macerated for essence. There was, however, a substantial demand for rose water, so part of the rose crop went to the stills.[13] It was never cohobated to extract the essential oil, because this would reduce the output of rose water.[14] However, 'green otto' - about 30 percent of the rose oil obtainable by cohobation - could be recovered by separation from the aqueous fluid.[15] It was sold to the perfumers as a by-product. Rose oil has a heavy cloying odour, inferior to that of rose essence, but it was particularly useful to perfumers for its own characteristics (including its relative cheapness). As otto was simple

[8] G W Septimus Piesse, *The Art of Perfumery*, (London 1855), p. 69.
[9] Arthur Young, *Voyages en France en 1787, 1788 et 1789*. Tr. Henri Sée. (Paris 1931), I, p. 433.
[10] M. Lovat Hewitt, 'The Uses of Synthetics in Perfumery', *P&EOR*, 28 (1937), p. 130.
[11] *P&EOR*, 40 (1949), p. 259.
[12] R M. Gattefossé, 'French Otto from Garden Roses', *P&EOR*, 5 (1914), p. 316.
[13] *P&EOR*, 16 (1925), p. 319.
[14] Gattefossé, 'French otto' p. 317; Iv. Manolov, *Poteklo i razvoj na rozovata industrija v B'lgarija*, (Sofia 1900), p. 62.
[15] J Ch. Sawer, *Rhodologia. A Discourse on Roses and the Odour of the Rose*, (Brighton 1894), p. 46; Bliznakov, *Rozovomaslenata ni industrija*, p. 20.

to produce, stable when sealed, and easily transported, the perfume trade imported most of its supplies from the cheapest source, Bulgaria, whose Damascene rose gave a slightly superior, and therefore dearer, essential oil to that of the French Centifolia.[16]

The origins of rose-oil production and trade in Bulgaria are unknown, but etymology suggests its transference from Persia.[17] Nothing is known for sure about it before the late eighteenth century[18]. A supposed reference to the rose-oil trade in the mid-eighteenth century by a British Ambassador in Constantinople relates, in fact, to the mid-nineteenth.[19] The earliest explicit source on Bulgarian rose oil refers to exports by a Bulgarian partnership to Germany and Austria in 1771.[20] In 1791 a French traveller observed the trading of rose oil at Kazanl'k, mainly, he thought, for export to France.[21]

Scattered references to the industry subsequently appear, including comments in 1819 by Pop Konstantin on the production of rose oil at Karlovo.[22] As rose-growing land was taxed we know that in 1826, 12,020 uvrats (of 0.16 hectares) of roses were grown in Bulgaria, mainly

[16] Manolov, *Poteklo*, p. 62.

[17] T. N. Karavanevski, *Rozovata ni kultura.* (Sofia 1922), p. 16.

[18] Bulgarian writers acknowledge an accredited tradition of rose cultivation for perfumery dating back at least to the seventeenth century, but lack convincing evidence. For example, Topalov and Irinchev instance a report in 1870 of a French consul, who was told that a Turk from Anatolia introduced boilers to Kazanl'k for distilling at the beginning of the eighteenth century. See V. Topalov, & I. Irinchev, *Rozoproizvodstvoto v B'lgarija.* (Plovdiv 1967), p. 25.

[19] There is no mention of the rose-oil trade in the official correspondence of ambassador Sir James Porter (Public Record Office, [P. R. O.] S.P. 97) nor in his book, *Observations on the religion, law, government, and resources of the Turks*, (2 vols, London 1768). However, in 1854, his grandson incorporated the text of Sir James's book within vol. I of a book of his own, in which are to be found five references to production and trade in rose oil and rose water, (George Larpent, *Turkey, its History and Progress* .... (London 1854), I, pp. 49, 114,115, 116, 150), roughly matching the 'facts' cited in Ivan Irinchev, Georgi Ognenski and Pet'r Delev, *Rozoproizvodstvoto v Kazanl'shkata Tundzhanskata dolina.* (Sofia 1994), p. 25 and Zarev, *Istorija*, p. 27. However, they occur in a section of Larpent's book comprising economic information current to the period in which he was writing and not in the part drawn from his grandfather's works.

[20] Topalov and Irinchev, *Rozoproizvodstvoto*, p. 42.

[21] Anon. [Charles M. d'Irumberry, Count de Salaberry] *Voyage...à Constantinople, en Italie, et aux iles de l'Archipel* ... (Paris 1799), p. 138.

[22] Konstantin Irechek, *P'tovanija po B'lgarija.* (Sofia 1974), p. 265.

in the Kazanl'k district. Other data both on the taxed area of cultivation and the revenue gathered suggest however that cultivation (at least at Kazanl'k) declined progressively between then and 1837.[23]

Unlike the French rose distillers, the Bulgarians cohobated their rose water for the sake of the higher yield in oil. There is no information as to when they began to do so, but it entailed no difficult technological leap. The same apparatus in which the roses had been distilled would be re-used to re-distill the rose water to obtain rose oil. This floated on the aqueous portion of the distillate, from which it could easily be separated, leaving diluted rose water as a by-product. The earliest explicit description of cohobation in Bulgaria I can find is of 1866,[24] while a dubious account of 1870 suggests that single distillation was still being widely applied.[25] However, the references to rose oil of 1771, of Salaberry (1791), Pop Konstantin (1819) Ami Boué (1830s)[26] Aprilov (1841) and the British consular papers of the 1835-50 never even mention rose water, which they would surely have done had rose water been the principal product. From this we infer that, throughout this period, Bulgarian rose water was normally cohobated, and that roses were therefore processed for the international rose oil market, rather than for rose water.

In 1835, most Bulgarian rose oil was marketed in Adrianople (Edirne). The perfume trade erroneously believed that this city was the source of the flowers.[27] Estimated output was 45,000 troy ounces (about 1,460 kg.) It sold at a mere 10s 6d per ounce, or 3 percent of

[23] *Dokumenti za b'lgarskata istorija. III. Dokumenti iz turskite d'rzhavni arhivi, 1564-1872*. ed. Pancho Dorev (Sofia 1940), doc. 157, p. 83. An unsourced display table at the Museum of the Rose Institute at Kazan'k gives cultivation data for 1830 (identical to that given for 1826, in Dorev's *Dokumenti*) and for 1831, 1836 and 1837. These show a fall at each reference date leaving the 1837 figure a mere 22 percent of the 1830 (or 1826) figure.

[24] R. Baur of Constantinople, 'On Attar of Rose', *Pharmaceutical Journal and Transactions*, [*PJT*] 2nd Ser. 9 (1867-8), p. 286.

[25] R. Jones Owen, *The Practice of Perfumery*, (London 1870), p. 23.

[26] Ami Boué visited Kazanl'k in the company of Viquesnel in the 1830s. In Boué, *Recueil d'itineraires dans la Turquie d'Europe*, I (Vienna 1854), p. 35, he relates that a young Turkish merchant offered them rose oil, packaged in glass phials designed to attract the taste of Turkish ladies.

[27] Rimmel, *Book of Perfumes*, p. 49.

[28] PRO FO 78 265, trade report for Adrianople of 2 Dec 1835, fo. 274.

the price of rose essence in France in 1787. It was counted (after hare-skins) as the principal article of Edirne and its consular district to be exported to Britain.[28] In 1836, British and 'other' European merchants were buying the oil in Adrianople and district, in competition with Russians, who enjoyed the advantage of paying a lower export duty.[29] The apparent slump in rose production between 1826 and 1837 seems to have been reversed by 1841, according to Aprilov who described the rose-oil production of Kazanl'k as 'first in the world', and the main item of the town's external trade, despite its flourishing woollen textile crafts.[30] In 1846, the sole British business house at Adrianople, George Schnell & Co. was trading in rose oil. Schnells complained that a quarter or more of the harvest was smuggled out to avoid the duty altogether.[31] An account of 1859 estimated that trade began to expand significantly from around 1844[32] and this is consistent with the available statistics displayed in Figure (i) below.

As a centre for rose-oil commerce, Adrianople lost its former importance. The primary commerce in the article became based on Kazanl'k and Karlovo in the rose valley itself, where supplies were purchased by merchants trading from Constantinople for re-export to Europe. By the 1850s, local enterprise had established extensive connexions to provide outlets for its oil. In 1858 the Kazanl'k firm of D. Papazoglu and Sons formed close links with the Bulgarian merchant house of Hristo T'pchileshtov at Constantinople, to which much of its oil was directed. T'pchileshtov supplied some of this oil to the firm of Mikastarian which traded in Marseilles. In 1875, Papazoglu was also exporting oil directly to New York.[33]

[29] PRO FO 78 314, trade report for Adrianople of 12 Jan 1837, fo. 171.

[30] V. Aprilov, *Dennitsa na novob'lgarskoto obrazovanie.* (Odessa 1841). On Kazanl'k's woollen trades see Aleksand'r Pavlov, 'Ikonomicheskoto razvitie i s'stojanie na gr. Kazanl'k', *Kazanl'k v minaloto i dnes*, I. (Sofia 1912), pp. 289-292.

[31] PRO FO 78 652, trade report of 31 Jan 1846, and Schnell-Wiltshire, 23 Jun. 1846, ff. 28, 30, 47.

[32] J Lawrence Smith, 'On the Manufacture of the Otto of Rose at Kisanlik, in European Turkey', *PJT*, 2nd Ser. 1, 1859-60, p. 143.

[33] Matej Georgiev, 'Stopanski izsledvanija za minaloto na Kazanl'k', *Iskra* (Kazanl'k), 31 Jan. 1938, p. 2; *Idem*, 'Kazanl'shkoto rozovo maslo na Amerikan. pazar predi osvobozhdenieto', *Iskra*, 30 Jun.1937, p. 2.

The Bulgarian merchants competed against European purchasers, who were also active in the rose valley. In 1859, Julius Kasselmann was bidding there for a quantity of oil sufficient to drive prices up. Kasselmann became an authority on the production of oil and by 1869 was resident at Kazanl'k.[34] In 1885 he represented Ihmsen and Co. who exported some 40 percent of the rose oil output of Kazanl'k at that time.[35] In 1871, foreigners dwelt semi-permanently in the Kazanl'k to buy the oil and send it to 'Europe'.[36] They were there partly to ensure that the oil they imported was free of adulterants.[37]

Production trends

Bulgaria's estimated annual output of rose-oil between 1832 and 1945 is tracked in Figure (i) below. Trade estimates for the volume of production began intermittently to appear in the 1830s, though they were heavily rounded. By the 1890s, trade estimates were supplemented by official crop statistics, which, at least in the early years, looked more precise but may well have been less accurate.[38] Where more than one estimate is available for any given year, the figures available have been averaged. From 1905 onward, a small part of the rose crop was converted to a new product, rose concrete, the feed-stock used for making rose absolute. The figure 1 output data include rose concrete in terms of the quantity of rose oil which could have been made from the same volume of flowers. As rose concrete was bulkier and less valuable than rose oil, the figures shown for this product are only one tenth of its actual output.[39]

Over the long term, two strong surges in production can be identified, the first (probably) from the late 1840s to the late 1860s, and the second,

[34] Matej Georgiev, 'Stopanski izsledvanija', p. 2; Anon. 'The Manufacture of Attar of Roses in Turkey, *PJT*, 3rd Series, 2 (1871-2), p. 1051.

[35] At. T. Iliev, *Staro-zagorski okr'g v narodo-ikonomichesko otnoshenie*, (Stara Zagora 1885), p. 61.

[36] Anon. 'Opisanie na kazanl'shko', *Pravo* (Constantinople), 25 Oct. 1871.

[37] Sawer, *Rhodologia*, p. 47.

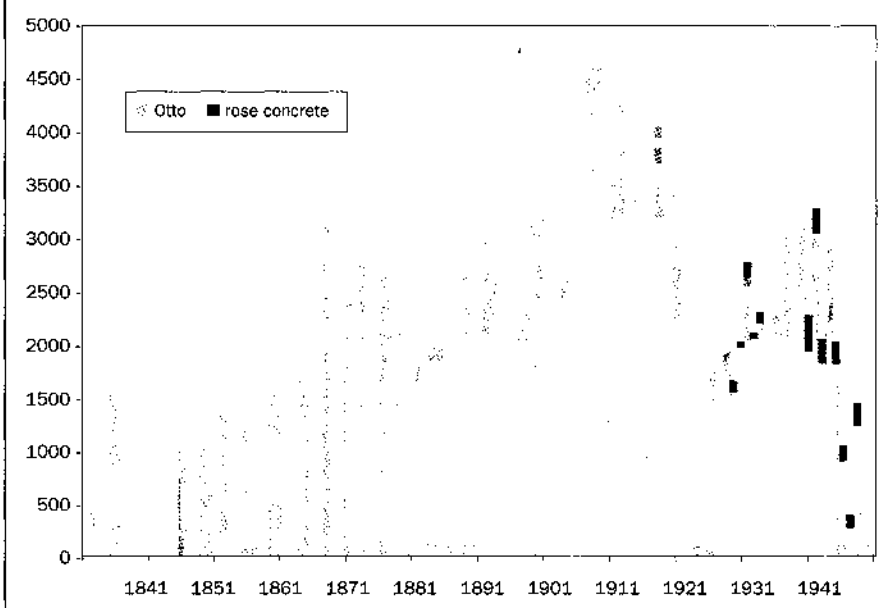
[38] Manolov, *Poteklo*, p. 47.

[39] On the basis of figures for flower use in producing rose concrete, in *P&EOR*, 18 (1927), p. 250, and the quantity exported that year.

from the late 1880s to an all-time peak in 1906. Between the World Wars, (1920-39) annual production fell to 64.8 percent of its level in 1895/1914.

Productive expansion during the late Ottoman era seems to have been fuelled by growth in international demand. In 1866, a *dünüm* (0.092 hectares) of rose bushes yielded one hundred *muskals* (481 grams) of oil, worth 1500 piastres (£13 12s 9d). The expenses in tithe, picking, land management and distilling amounted to 540 piastres. The easy profitability of the business and the low acquisition price of rose gardens led the British consul at Adrianople to advise them as a sound investment opportunity.[40] From 1878, the year of Bulgaria's

FIGURE 1 - Rose oil output 1832-1945 (kg.)
(Includes rose concrete equivalents)



For data and sources, see appendix.

[40] Report by Mr Vice-Consul Blunt on Kizanlik and on the Manufacture of Attar of Roses in the Vilayet of Adrianople for the Year 1866, *Commercial Reports Received at the Foreign Office from Her Majesty's Consuls in 1867*, pp. 242-4. (Great Britain, Parliamentary Papers, 1867, LXVIII.). F. Kanitz, 'Volkswirthschaftliches Croquis aus Bulgarien', *Oesterreichische Monatschrift fur den Orient*, 1 (1875), p. 9 confirmed that the rose gardens were highly profitable.

liberation, onwards this ceased to be the case. Virtually all rose production was now carried out on a petty scale, and larger investors, even the merchants engaged in the trade, evinced no interest in acquiring rose-bearing land.

The growth of output was driven by expanding the area under cultivation. In 1826, at least 1,923 hectares of roses in Plovdiv province were taxed.[41] Since the first reasonably reliable modern areal estimate - for 1887 - was of 20,425 *uvrats* - 3,276 hectares,[42] the expansion of cultivation between these dates was always gradual. Judging from output figures, and assuming constant yields, cultivation expanded till the late 1860s, then tended to fall between 1871 or 1875 and 1887.

The collapse of Ottoman rule in Bulgaria after the Russo-Turkish war of 1877-8 caused an upheaval for the rose-oil trade, and probably retarded its progress. During the Ottoman period, rose production seems mainly to have been in Turkish (Muslim) hands.[43] Not only were the rose farms despoiled by military operations,[44] but Russian occupation led to ethnic cleansing and the mass flight of Muslims. Many former Muslim villages and properties were taken by in-coming Bulgarians, predominantly from non-rose growing villages on the north slope of the Balkan. They took up rose growing on their new properties, but seem to have lacked the skill and experience of their predecessors. At Kazanl'k, the rose gardens suffered after the liberation not only from damage but also from neglect, so otto production shrank sharply.[45] In some places the liberation proved terminal to rose growing. At Koprivshtitsa, where it had flourished since 1850, it was abandoned in the early 1880s, and the gardens were re-converted to tillage and meadows. Koprivshtitsa was a high-altitude location, but a local historian with personal rose-growing connexions attributed

[41] *Dokumenti*, doc. 157, p. 83.
[42] *Svedenija po ikonomicheskoto s'stojanie na B'lgarija*, (Sofia 1888), pp. 188-9.
[43] Karavanevski, *Rozovata ni kultura*, pp. 29-30.
[44] Anon. 'Rose Farming as a Colonial Industry', *PJT*, 3rd Ser. 10 (1879-80), 13 Dec. 1879, p. 469.
[45] Karavanevski, *Rozovata ni kultura*, p. 30; C. Janssen, 'Rapport sur la situation économique de la Roumélie orientale ... Sofia, 4 June1880', Belgium. *Recueil Consulaire*, 32 (1880), p. 105.

the post-liberation collapse of cultivation to negligence and a lack of skilled labour.[46] The difficulties of the rose-oil trade in the 1880s reflected a more widespread economic malaise in Bulgaria, whose causes I have tracked elsewhere.[47]

Rose growing recovered fairly rapidly as strong market conditions set in from the late 1880s, and the rose-oil industry expanded until World War 1 untroubled by external competition. The structural changes following the liberation were probably not reversed. This formerly labour-intensive industry, in which the 'greatest care' had been bestowed on cultivation,[48] became decreasingly intensive in technique. In 1889 it was observed that the gaps between the rows of flowers had been widened to substitute ox-ploughing for human labour in soil maintenance tasks. Alongside this systematic factor shift, other indications of extensive methods led to informed concern. Much discussion centred on the displacement of the red rose by the inferior and soil-exhausting white rose, whose main virtue was its hardiness and the lack of care which needed to be devoted to it.[49] In 1900, the lack of 'former enthusiasm' in working the rose gardens was attributed to low prices,[50] but at a conference of rose growers in 1906, the red to white displacement was linked by one participant to a reduction in intensity:

'In former time people took greater pains in cultivating roses. Livestock raising was more developed then, so the rose producers disposed manure for the rose gardens, so these were not so weak and withered as they are today.'

His opinion was supported by another contributor, who also blamed the shortage of manure and lack of use of artificial fertilizer.[51]

[46] L N. Oslekov, 'Koprivshtitsa...' *Jubileen zbornik po minaloto na Koprivshtitsa (1876-1926).* (Sofia 1926), p. 460; I. G. Govedarov, *Koprivshtitsa v svr'zka s duhovnoto ni i politichesko v'zrazhdane,* (Sofia 1919), p. 82.

[47] Michael Palairet, *The Balkan Economies c. 1800-1914. Evolution without Development,* (Cambridge 1997), pp. 173-201.

[48] Anon. 'Rose Farming as a Colonial Industry', *PJT,* 3rd Series, 10 (13 Dec. 1879), p. 469.

[49] Christoff, *L'industrie des roses,* pp. 25, 31; Sawer, *Rhodologia,* p. 36.

[50] Manolov, *Poteklo,* p. 92.

[51] *Prva konferentsija v'rhu rozovata industrija, Plovdiv, 19 - 26 Junij 1906 g.* (Plovdiv, 1906), Debates section, pp. 45-46.

These views were linked with concern that areal rose-crop yields were declining. We cannot trace this (probable) decline from the liberation period, because systematic statistics for area cultivated only begin in 1887 and the data for the early years (to 1892) are far from secure. However, five-year average yields from 1889-1925/9 fluctuated about a slow downtrend, as is shown in Table 1. It is reasonable to suppose from the above evidence that this decline was linked to decreasing intensity. Stagnation or decline in yields before World War 1 may also reflect expansion onto marginal locations (for which reason, the area of cultivation is also included in the table), but the problem was more deeply seated. Even when the crop area declined, as it did after the war, yields fell further. Writing in 1926, Zlatarov blamed the war for leaving the gardens short-handed. Under-manuring, the monoculture of roses and the system by which they were re-planted contributed to the degeneration of the stock and its increasing

TABLE 1 - Rose cultivation and yields

	ha.	kg./ha.
1889/92	2760	1746
1895/99	4685	1693
1900/04	5886	1657
1905/09	7370	1745
1910/14	7939	1298
1915/19	8420	1154
1920/24	5179	1058
1925/29	5568	1219
1930/34	6763	1283
1935/39	6210	1674

Sources:
(1) cultivation:
1889/92: I. Atanasov, *Statisticheski zbornik na Knjazhestvo B'lgarija.* (Sofia 1897) p. 398.
1895-1896, 1900-1902: Zlataroff, *La Rose*, p. 6.
1935: Official data assembled by E. Bonchev, in Iskra (Kazanl'k) 15 Apr. 1938.
1897-1899, 1903-1934, 1936-1939: *Statisticheski godishnik na B'lgarskoto Tsarstvo, (SGBTs)* 1909, and sequential to 1941.
(2) Flower output:
1889-1892: Atanasov, *Statisticheski zbornik*, p. 398.
1895-1896, 1900-02: estimated from oil production of current years, assuming same ratio of flower output to oil production as in 1904-1906.
1897-1899, 1903-1907 and 1938-1939: SGBTs, 1909, p. 25, and sequential.
1906-26: Iv. Genev, 'Rozovata kultura', p. 358.
1927-1937: *Iskra*, 15 Apr. 1938.

susceptibility to sickness.[52] This view was endorsed by Genev, who attributed declining yields to plant diseases, irrational cultivation and lack of care, and the (alleged) unprofitability of rose production.[53]

Areal yields recovered during the late 1920s and the 1930s. To some extent this reflected recovery from the abnormal conditions in the aftermath of World War 1, the work of the agricultural extension services, and the onset of high rose prices in 1925-1930. The further advance from the mid-1930s may also reflect producer response to restrictions on the area cultivated.(See below, p. 37).

Adulteration and synthetics competition

Though Bulgaria enjoyed a dominant position in the world rose oil market, until 1932 there was brisk mutual competition between merchants in the sale of Bulgarian oil. Besides this, Bulgaria's apparent monopoly was always contestable, because the demand for its rose oil was given a certain elasticity by alternative supplies. Whenever prices boomed, competition always appeared at the margin, though the only efforts in establishing the crop which enjoyed a lasting success were those carried out in Anatolia. Rose growing in the valley of Lake Burdur, near Isparta, Konya vilayet, was given impetus, ironically, by the forced departure from the rose valley of ethnic Turkish rose producers after Bulgaria's liberation. Their new gardens struggled until 1894, when an emigrant smuggled cuttings from Bulgaria and secured Ottoman government backing for a scheme to disseminate the cuttings and the techniques to grow them.[54] Anatolian output in 1912 and 1913 was estimated at 300 and 400 kg.[55] In 1913, the import to Great Britain of Anatolian rose oil was reportedly higher than that obtained from Bulgaria. Its quality was 'particularly fine' and it was

[52] As. Zlataroff, *La rose et l'industrie d'essence de roses en Bulgarie*, (Sofia 1926), p. 7.
[53] Iv. Genev, 'Rozovata kultura', *Spisanie na B'lgarskoto Ikonomichesko Druzhestvo*, [*SpBID*] 27 (1928), pp. 358-9.
[54] Manolov, *Poteklo*, p. 63; Christoff, *L'industrie des roses*, pp. 21-22; M. Stefanova, *Rozovoto maslo i rozovata kultura v nas*. (Sofia 1925), p. 7.
[55] *P&EOR*, 4 (1914), pp. 327, 338.

attractive to purchasers because it was 'very free from adulteration so frequently practised in Bulgaria.'[56]

The floral industry of the Midi was not a serious competitor. The peculiar conditions pertaining in World War 1 fostered hopes that the loss of the international rose-oil market by Bulgaria and Turkey could be turned permanently to French advantage,[57] but these were unrealizable. Costs were too high. In Bulgaria (probably in 1924) roses were sold at 8 leva per kg., and in France for the equivalent of 50-60 leva.[58] Rose oil was still only a by-product from distilling rose water.[59] Annual otto production in the Midi on the eve of World War 1 was 300 kg.[60] This was hardly likely to rise, despite promotion of on-farm distillation, since rose supplies were increasingly being diverted to the cut-flower trade.[61]

Competition to Bulgarian rose oil developed less from alternative sources of natural product supply than from product substitution. So costly a commodity as rose oil inevitably attracted the attention of sophisticators, who would stretch rose oil supplies by adulterating them with cheaper materials. Before World War 1, this practice was so prevalent in Bulgaria as to overload the market and depress prices.[62] From the end of the nineteenth century, the looming threat, and one which ultimately sent the industry into irrevocable decline, came from advances in organic chemistry, which began to fulfill the hopes of perfumers for cheaper 'synthetic' substitutes.

Bulgaria's rose oil was always a target for adulteration. Possibly from the 1820s and at least from the 1850s, the adulterant of choice was palmarosa oil, distilled cheaply in India from Andropogon grass.[63] In 1896, when otto of rose was quoted on London at 35 to 42 shillings

[56] John C. Umney, 'Perfumery', *Journal of the Royal Society of Arts*, 62, (1913/14), pp. 50-51.
[57] *P&EOR*, 8 (1917), pp. 210, 220-21, 330-1.
[58] Kata Chobanova, 'Rozoproizvodstvoto i rozomaslenata industrija v B'lgarija', *Izvestija na d'rzhavnite arhivi, 1968.* (Sofia), p. 272.
[59] *P&EOR*, 8 (1917), p. 220.
[60] Gattefossé, 'French Otto', 316; *P&EOR*, 16 (1925), p. 316.
[61] *P&EOR*, 4 (1913), p. 267.
[62] Manolov, *Poteklo*, p. 76-7.
[63] Sawer, *Rhodologia*, p. 85; Daniel Hanbury, 'On Otto of Rose', *PJT*, 18 (1858-9), pp. 506-7.

per ounce, 'Turkish geranium' (i.e. palmarosa) was priced at 9d.[64] In 1856/7, 6,280 litres of palmarosa were exported from Bombay. The oil re-appeared mainly in Jeddah, whence it was carried northward to Smyrna and Constantinople, allegedly by Mecca pilgrims.[65] The odour of palmarosa resembled that of the rose, though it betrayed itself by a penetrating after-smell of lemon. However, the after-smell could be removed. In Constantinople, palmarosa was processed by the merchants, by being shaken repeatedly with water. The resulting emulsion was left to stand and separate, then the oil was partly evaporated in the sunshine.[66] Not all the palmarosa imported from Bombay was used for adulterating rose oil, for palmarosa was a cheap perfume ingredient in its own right. However, a large amount was devoted to this purpose. In 1840, an Ottoman prohibition against adulterating otto was repealed, and in 1859 it was remarked that dilution to the extent of 50-200 percent was common in Bulgaria.[67] The same year growers were observed sprinkling palmarosa on the rose flowers before distilling them,[68] an effective means of concealing adulteration which did little harm to the rose odour. They were still doing so 46 years later, though allegedly to a lesser extent.[69] Therefore, much of the oil had already been heavily adulterated by the growers and by local merchants even before being dispatched to Constantinople whose merchants contaminated it still further.[70]

Rose otto is composed of eleoptene, comprising the odoriferous volatile alcohols, and stearoptene, an odourless hydrocarbon wax dissolved within it. Until the 1890s it was not possible to detect sophistication by chemical testing, because the chemical composition of eleoptene was unknown. Even later, detection remained difficult because the major ingredient of palmarosa, which gave it its rosy

[64] *Soapmaker and Perfumer*, 16 Mar. 1896, p. 36.
[65] Hanbury, 'Otto of Rose', 507.
[66] C. G. Warnford Lock, 'Rose Oil, or Otto of Roses', *PJT*, 3rd Ser. 11 (1880-81), p. 900.
[67] Hanbury, 'Otto of Rose', p. 506; Smith, 'Manufacture of Otto', p. 144.
[68] Anon. 'Manufacture of Otto of Roses', *PJT*, 2nd. Series, 1 (1859-60), p. 267.
[69] Petko Iv. Orozoff, et fils, Kazanl'k, *L'Histoire de la rose*, (Kazanl'k n.d.), p. 13.
[70] Anon. 'Commercial Otto or Attar of Roses', *PJT*, 18 (1858-59), p. 413; Hanbury, 'Otto of Rose', p. 506.

odour, was the complex alcohol geraniol. This was itself a principal ingredient of eleoptene. Moreover, the proportion of geraniol found naturally in Bulgarian rose oil varied markedly from place to place and year to year, making it difficult to certify purity on the basis of chemical composition.[71]

The presence of palmarosa could supposedly be detected by physical tests. Pure rose oil would congeal at around 15-17° Reaumur. The higher the stearoptene content, the higher the congealing temperature, so adulteration with palmarosa, which contained no stearoptene, should cause the congealing temperature to fall. Therefore a congelation test was applied by the merchants to samples of rose otto offered by the peasants. At farm gate a base price was agreed for the oil per *muskal* (of 4.8 grams) per degree Reaumur. The phials of oil were then tested thermometrically after submersion in a basin of cooling water, and valued by multiplying the base price by the temperature at which it congealed, with a price maximum at 16°. Below 12° R the oil was rejected. The sophisticator's simplest response was to add waxy substances to the oil to raise its congealing point, but this was detectable from the way the oil crystallized.[72] A more effective way to deceive the purchaser of otto which had been sophisticated with palmarosa was therefore artificially to raise the proportion of stearoptene in the oil, and consequently to raise its congealing temperature.

Oil from the red Bulgarian *Rosa Damascena* contained less stearoptene than oil distilled from the white rose which also throve in the rose valley, and was estimated by a leading merchant in 1906 to account for about one eighth of the harvest.[73] The oil yield of the white rose was low, and its quality inferior.[74] The Bulgarians justified growing the white rose on the ground that was that it was hardier than the red, and yielded more flowers per hectare, but its prime

[71] Stefanova, *Rozovoto maslo*, pp. 12-13.
[72] Manolov, *Poteklo*, pp. 68, 83; Christoff, *L'industrie des roses*, pp. 49-50; Sawer, *Rhodologia*, pp. 63-4.
[73] *Prva konferentsia*, (debates), p. 43; Irinchev *et al. Rozoproizvodstvoto*, p. 37 give an unsourced estimate of 30 percent.

attraction to rose growers was its 'richness' in stearoptene. By putting 'an exaggerated proportion' of white roses in the still with a charge of red roses, producers - mainly the poorer peasants, according to merchant Hristo Hristov - obtained oil with a higher congealing temperature, which would withstand a 5-10 percent admixture of palmarosa without being betrayed by the congelation test.[75] Adulteration of up to 5.5 percent was also undetectable by optical rotation.[76]

The buyers knew what was going on, for white roses abounded in the rose gardens. They regretted not being able to quantify the extent of adulteration. They knew that the congelation test was ultimately irrational, since it rewarded the grower in proportion to the concentration of stearoptene, a substance which was itself worthless. Indeed- an honest producer who offered pure red-rose oil would have been penalized by the test. So it provided only a frail limitation on the extent to which the grower could adulterate his oil with palmarosa without detection, and indeed virtually forced him to adulterate it to a modest extent. This perverse system of purchasing by stearoptene content was still widely practised as late as 1913, though importers were now urging its abandonment - but all they had to offer in its place was 'the old, but only reliable test - the nose'.[77] The congelation test was still sometimes used as late as 1925.[78]

The concern to maximize the stearoptene content of their oil had the further perverse effect that in cohobating the rose water to extract the oil, producers allowed oil to discharge from the outlet pipe after insufficient cooling. The lighter fractions therefore 'smoked' into the atmosphere. A significant proportion of the oil (perhaps as much as 30 percent of it) was lost by inefficiencies in distilling, in part intentional, in part because of poor still design.[79]

[74] Christoff, *L'industrie des roses*, p. 13.
[75] Manolov, *Poteklo*, p. 70; Christoff, *L'industrie des roses*, pp. 13-14.
[76] Conroy, M. 'Otto of Roses', *Soapmaker and Perfumer*, 15 Dec. 1896, p. 124.
[77] *P&EOR*, 4 (1913), p. 367.
[78] *P&EOR*, 16 (1925), p. 302.
[79] A. Papazov, 'Raport po destilatsijata na rozite', *Trgovski vesti*, 19 Jun. 1899, p. 1.

When the agents of the merchants collected the oil from the growers they immediately bulked it. The merchants allegedly adulterated their oil further still so that even the best available contained 10-20 percent palmarosa.[80] The oil was offered by them to clients in different commercial grades, which were thought to denote no more than the extent to which the oil was diluted, since there was no intrinsic reason why one oil should be finer than another.[81] They packed most of it in *konkums*, large tin-lined copper containers, insulated with felt packaging, for export. Before export the tops of the *konkums* were sealed or welded. Till about 1886,[82] their usual destination was Constantinople, where the *konkums* were opened, their contents further adulterated, then transferred into attractive glass containers for resale. Western merchants considered that oil in the original sealed *konkums* was less heavily adulterated than the contents of these fancy bottles. When they could obtain otto in *konkums*, they were willing to pay a premium for it.[83] It is probable that the trade diversion from Constantinople in favour of direct export to western Europe was to avoid buying oil adulterated with palmarosa,[84] but this did not in itself put an end to falsification.

To try to stamp it out, the Bulgarian government prohibited the import of palmarosa in 1889, since adulteration of rose-oil was the sole purpose for which palmarosa was used in that country. Some sources are contemptuous of this measure, claiming that it merely deflected the palmarosa supply to the smuggling trade.[85] In about 1902, the government began placing seals on rose-oil packages leaving Bulgaria, as a guarantee of Bulgarian origin.[86] The oil continued to be adulterated. In 1912, some samples from Bulgaria were allegedly adulterated to the extent of 40-50 percent.[87] According to one merchant firm (implicitly attacking its rivals) 'adulteration ... increases from year

[80] Manolov, *Poteklo*, p. 70.
[81] Iv. Genev, 'Samo edno kachestvo e b'lgarskoto rozovo maslo', *Iskra*, 15 Sept. 1937, p. 1.
[82] Topalov and Irinchev, *Rozoproizvodstvoto*, p. 46.
[83] Hanbury, 'Otto of Rose', p. 506.
[84] Anon. 'Rozovo maslo i tershe', *Pomin'k* (Sofia), 4 Dec. 1897, p. 2.
[85] Manolov, *Poteklo*, pp. 69-77.
[86] Enu Bontcheff (Enju Bonchev), 'The Rose Industry of Bulgaria', *P&EOR*, 3 (1912), p. 267.
[87] *P&EOR*, 3 (1912), p. 130.

to year.'[88] By comparing the annual returns for oil exports between 1897 and 1911 with those for oil production, which were consistently lower, the official statistician Kiril Popov demonstrated the probable extent of adulteration.[89] However, merchant interests rejected this comparison, claiming that the export quantities were precise, whereas producer villages habitually under-reported the quantity of oil they produced, in order to minimize their tax liabilities.[90]

From the point of view of the perfumers, this fraud-ridden business was thoroughly vexatious. They could employ more searching tests than that for congelation, for example measuring specific gravity and refractive index, as well as relying on the comparative testing of odour, but none were fail-safe. Therefore they tended to buy according to the confidence they attached to the label of the merchant who had consigned it. This was an unsatisfactory basis, because even if the merchant himself were of good repute, he could not be sure of the degree of adulteration in the oil he had bought from the peasants. Lacking large-scale distilling facilities under his immediate control, he could offer little oil of guaranteed provenance. Besides, while the merchants protested the purity of their own products, they vociferously denigrated that of their rivals.[91] Therefore western experts assumed that all the oil they were offered was to some degree contaminated, and were reluctant to pay a premium for otto certified to be pure, since they lacked the means of verifying that this was, indeed, the case.[92]

Towards the end of the nineteenth century it became possible to make 'floral' perfumes from a growing range of artificial feed-stocks. Progress in this field depended on the advances made in industrial organic chemistry in Germany which are associated with the rise of the dyestuff industry.[93] The new chemistry established scientific

[88] Letter from P. J. Orozoff et fils, Kazanl'k, 11 Jan 1912, *P&EOR*, 3 (1912), p. 13.
[89] Kiril G. Popov, *Stopanska B'lgarija*. (Sofia 1916), p. 203.
[90] D. Duhovnikov, *Rozovata kultura i industrija i zakonoproekta po s'shtiti*. (Plovdiv 1922), p. 11.
[91] Manolov, *Poteklo*, pp. 70, 85.
[92] A. Bojadzhiev, 'Trgovijata s rozovo maslo v stranstvo', *Prva konferentsija v'rhu rozovata industrija*, (Plovdiv 1906), pp. 35-37.
[93] *P&EOR*, 7 (1916), p. 3.

techniques for isolating and analyzing essential oil ingredients. Chemists were employed by the perfumers to establish objective tests for adulteration,[94] but their analysis of essential oils usually had the object of identifying their natural constituents so as to reproduce them from cheaper raw materials.[95] Some perfume feed-stocks were synthesized from coal-tar derivatives, and bore no chemical affinity to the natural product, for example Ionone, or synthetic violet, the first of the true floral synthetics, which came on the market in 1893.[96] Once their chemical composition had been established, the main component alcohols of the rose odour could be obtained from cheaper essential oils by isolation from their other constituents.[97] These products were not strictly synthetic, because they underwent no alteration in chemical structure. Geraniol (marketed as Rhodinol) was identified as the principal component of eleoptene in 1891, and in 1894 a different research team discovered its structure to be identical to the geraniol content of palmarosa.[98] As geraniol was the only alcohol in palmarosa, it was easy to isolate it from this cheap raw material.[99] It was being offered on the market in 1896,[100] if not before. By 1921, an extended range of artificial rose constituents including citronellol, geraniol, linalool, p.e.a. and citral had become available, at descending prices. Leaders in the field were the house of Schimmel of Leipzig, whose patent synthetic rose oil contained 80 percent geraniol, small proportions of the above chemicals, and octyl aldehyde.[101]

There was no quick transition from the use of expensive natural rose oil to its substitution by synthetics. Initially, the perfumes based on them were of inferior quality. This was because the early synthetics

[94] Manolov, *Poteklo*, p. 73; Stefanova, *Rozovoto maslo*, p. 14.
[95] *P&EOR*, 7 (1916), p. 3.
[96] Lovat Hewitt, 'Synthetics', p. 57.
[97] *P&EOR*, 8 (1917), p. 144.
[98] Zlataroff, *La rose*, pp. 36-7.
[99] M. Otto, *L'industrie des parfums d'apres les théories de la chimie moderne*, (Paris 1909), p. 354; Geoffrey Martin, *Perfumes, Essential Oils and Fruit Essences*, (London 1921), p. 44.
[100] *Soapmaker and perfumer*, 16 Mar 1896, p. 30.
[101] Martin, *Perfumes*, p. 33.

contained impurities which were difficult to remove, and which destabilized products made from them.[102] Though their quality improved, synthetics hardly began to displace otto in established floral pefumes before 1914, and found their main outlet in extending the product range of the toiletries' manufacturers. For example, p.e.a. was much used in making toothpaste.[103]

Secondly, as well as its bulk components of citronellol and geraniol, rose oil contains trace constituents which contribute powerfully to its odour. To isolate and identify them was expensive, because of the high cost of the material from which they had to be extracted.[104] So, to make a decent perfume that retained the true rose odour, natural otto had to be added to the 'synthetic' oils for the sake of its trace constituents. Even in 1917, when supply was exceptionally difficult, 'all the synthetics' contained some otto.[105] For example Schimmel's artificial 'rose geraniol', indistinguishable in odour from natural rose oil, was made by distilling geraniol over natural rose petals to provide the trace quantities of the other chemicals needed. This was much cheaper than natural otto, and 'rose geraniol' was used by 1921 for fine-scented toilet soap.[106]

So far from shrinking the market for rose oil, as producers of the natural product feared, the synthesis (or rather isolation) of its main constituents tended until the late 1920s to sustain the demand for it. As the range of synthetics available to the perfumer widened, so 'consumption of natural perfumes has increased because the synthetic ... has allied itself with the [natural product] and produced new odour combinations.' French perfumers were quick to appreciate their potential. Though derided initially as 'German rubbish', many synthetics were in fact discovered in France. As they improved in quality and in range, while falling in price, they contributed to the 'democratization' of perfumery, broadening the market for both

[102] Umney, 'Perfumery', p. 57.
[103] *P&EOR*, 2 (1911), p. 147; 4 (1913), p. 248; 5 (1914), p. 16; Eugene Charabot, 'Artificial perfumes', *P&EOR*, 1 (1910), p. 239.
[104] Stefanova, *Rozovoto maslo*, p. 13; Lovat Hewitt, 'Synthetics', 82.
[105] *P&EOR*, 8 (1917), p. 330.

- What do you think about this business, sir, when the roses are uprooted will the situation be rosier?

- You hold your tongue, that's my business!

Kooperator (Sofia) 14 Mar. 1936.

synthetics and natural products.[107] They introduced the user of cheaper synthetics to better quality but affordable products, which continued to contain a proportion of natural material. In 1921, French perfumers were using otto 'very freely in all their new creations', and any synthetic feed-stock worthy of application in high-grade perfumery in 1923 needed to contain about 25 percent real otto.[108] Contrary to the expectation that the Grasse perfumery houses would remain aloof from exploiting the synthetics, they were manufacturing them by 1912, and engaging in an active exchange of synthetics with German and Swiss manufacturers.[109] At Grasse, this caused the floral perfume industry no injury (by 1910) - and allegedly assisted its progressive evolution. Indeed, the admixture of synthetics with natural products not only cheapened the end product to the consumer, but also was capable of enhancing and imparting originality to the odour of the natural material.[110] So the demand for rose oil proved elastic to the falling price of the end product of which it formed a diminishing fraction.

This process was not, however, capable of infinite extension. During that last prosperous decade before World War 1, the expansion in demand for rose oil out-paced the growth of supply and caused prices to rocket. Quoted on London at 16s 6d per oz. in 1901, and 18s in 1906, it reached 60s in 1912, and 65s in 1913.[111] This provided a powerful stimulus to perfumers to substitute synthetics, and the trade hoped this would 'make its influence felt in world demand for Bulgarian otto' (i.e. would lower its price).[112] Though, in the shorter term, the effect was perverse, because of the continuing need for natural rose oil in high-grade perfume, the influence of the cheap 'synthetics' on prices would inevitably be felt in the longer run. The

[106] Martin, *Perfumes*, p. 44.
[107] J-P. Durville, *The Preparation of Perfumes and Cosmetics*, (London 1923), pp. 46-47; Umney, 'Perfumery', p. 57.
[108] *P&EOR*, 12 (1921), p. 262; Durville, *Preparation of Perfumes*, p. 77.
[109] *P&EOR*, 3 (1912), p. 3.
[110] Charabot, 'Artificial perfumes', pp. 239-240.
[111] *P&EOR*, 3 (1912), p. 291; 4 (1913), p. 248.
[112] *P&EOR*, 2 (1911), p. 147.

war itself caused further progress with synthetics, so in its aftermath, the demand for otto was weaker than might have been expected, even allowing for the shrinkage of post-war consumer purchasing power.[113] However, the impact on Bulgarian producers of this potential shrinkage in the demand for rose oil was deferred till the 1930s, as it was masked by a deterioration in supply which supported prices.

After World War 1, the supply delivered to the market never reattained pre-war levels. During the war, the area in Bulgaria under rose gardens had (surprisingly) risen, despite the loss of demand from western markets which had absorbed most of the output. But, for want of labour and weakness in the demand for rose oil, standards of cultivation, in particular pruning and replacing diseased bushes, were allowed to slip. Neglect facilitated the spread of crop diseases. These were not effectively eradicated even when demand conditions improved, as they did from 1924 to 1930.[114] During the war, most of the oil produced was stockpiled in expectation of an eventual return to high peacetime prices, and 8,928 kg. had accumulated by the armistice. In 1919 stocks were taken over by the government. About 3,500 kg. were consigned to the U.S.A. to pay for relief grain,[115] and this supply flooded the market. It took several years to get rid of the overhang,[116] so faced with rock bottom prices (in real terms) growers in the rose valley turned between 1921 and 1923 to alternative cultures, especially tobacco, for which international demand was rising strongly. Many destroyed their rose bushes to accommodate it.[117]

When world market prosperity returned in about 1925, the market for otto quickly encountered supply-side constraints. These sent the price realized by rose-oil exports soaring once again, from 25,000 leva per kg. in 1924 to 111,000 in 1930. Once more this stimulated the search for substitutes, and for cheaper ways of making them, further reducing the desired admixture of otto in rose-perfumery products.[118]

[113] *P&EOR*, 11 (1920), pp. 86, 88.
[114] Konstantin Georgiev, *Maslodajnata roza i nejnoto otglezhdane*, (Kazanl'k 1928), p 7.
[115] *P&EOR*, 12 (1921), p. 108.
[116] Bliznakov, *Rozovomaslenata ni industrija*, p. 18.
[117] *P&EOR*, 12 (1921), p. 108; 14 (1923), p. 277; 15 (1924), p. 433.
[118] Enju Bonchev, 'Rozovata industrija', *Iskra*, 31 Dec. 1936, p. 5.

By 1925 it was down to 15 percent,[119] and by 1932 even 'really superior perfumes' were 'rounded off' with not more than 5 percent of natural rose oil. A 'fine composition' could be obtained without using any at all.[120] Therefore the World slump was to have a peculiarly severe impact on Bulgarian rose growers. This was not just a cyclical down-turn in demand for a consumer luxury from which the grower might expect an eventual recovery. Perfumers had learned how to dispense with the natural product, except to meet a narrow demand for high-priced floral perfumes. Even in the more prosperous later 1930s, no return of pre-1914 demand conditions was in prospect. The 'synthetics' had themselves changed the structure of perfumery demand. Gone were the days when a relatively limited range of floral odours were available, and perfumers now exploited their ability to promote new chemical formulae and to adapt to fashion shifts.[121] For example, the 'rage' in 1937 was for gardenia perfumes which were pure synthetics bearing no chemical affinity to the scent of the gardenia flower, but possessed of an accidental similarity in odour.[122]

The blending of rose oil with 'synthetics', as practised by the perfumers, differed little from the adulteration process so widely used in Bulgaria, using cleaned up palmarosa. The essential oils importers recognized that the use of synthetics had the same aim as the adulteration practised in the Bulgarian villages - to solve the problem of 'how the alcohols can be extracted in purest form from the cheapest source, and used for sophisticating the more expensive products.'[123] Not surprisingly, by 1910, geraniol was being exported to Bulgaria, providing sophisticators with a superior adulterant to palmarosa, making the substitution more difficult to detect.[124] On the other hand, improved understanding of the chemical composition of rose oil resulted in a growing confidence, especially after World War I, on the

[119] *P&EOR*, 16 (1925), p. 339.
[120] A. Wagner, 'Roses in Perfumery', *P&EOR*, 23 (1932), p. 179.
[121] N. Saev, 'V'nshnata ni t'rgovija s rozovo maslo', *Izvestija i stopanski arhiv na Ministerstvoto na t'rgovijata, promishlenost'ta i truda*, 1/2 (Sofia, 1 Oct 1931), p. 33.
[122] Lovat Hewitt, 'Synthetics', p. 81.
[123] *P&EOR*, 5 (1914), p. 10.
[124] *P&EOR*, 1 (1910), p. 80; 3 (1912), p. 257.

part of the importers, that their experts could - at a cost - detect at least the grosser forms of falsification. Because of the year-to-year changes in the composition of the oil, the importers needed samples for comparison which they could certify to be pure - for which purpose they sent their own representatives to Bulgaria, to acquire oil distilled under their own supervision. The knowledge that falsification was increasingly likely to be detected, and could put at risk confidence in their products, conditioned the practices of the Bulgarian rose-oil merchants. It by no means eradicated the problem of adulteration, but it did lead to profound structural changes in the trade.

Manufacturing

Till 1903, all Bulgaria's rose oil was distilled in simple peasant stills. These were cylindrical copper boilers of about 110 litres capacity which would be charged with rose flowers together with water, and heated on a slow wood fire. The top of the boiler was sealed by a mushroom, shaped cap from which the vapour was discharged into a straight-through metal pipe. The pipe served as a condenser by being inserted laterally through a barrel of water, which was kept cool by a stream of water passed into it from a sluice. Rose water, the distillate, was collected from the outlet of this pipe into flasks. When a sufficient number of flasks of rose water had been collected, the boiler was filled with their contents, which were re-distilled in the same apparatus. Until the technology was changed, a battery of five such boilers was the characteristic production unit and no advantage was derived from increasing its size beyond 12.[125] With experienced handling, the peasant still could turn out excellent rose oil. It would have benefited by substitution of the straight-through pipe with a more efficient condenser, but this would have required a very delicate adjustment in the cooling system to prevent congelation from occurring in the condenser, and blocking it.[126]

[125] Bliznakov, *Rozovomaslenata ni industrija*, p. 9.
[126] Sawer, *Rhodologia*, p. 46.

The merchants always tried to some degree to bring the distilling process under their own control. In 1859 most distilling was in merchant hands, at least in the district of Kazanl'k, for the growers there 'seldom or never' distilled their own roses, but sold them to the distillers of the town.[127] The Papazoglu firm, in particular, bought these flowers,[128] while Hristov's also wanted to expand this business, as they (unsuccessfully) set up a French-built steam-distilling plant in 1875.[129] Subsequently, probably after the 'liberation' of 1878, distilling passed mainly into grower hands and most oil was produced in their own stills. This led to a multiplication in the number of stills which was disproportionate to the volume of oil that passed through them. In 1859, the crop was serviced by 2,501 stills,[130] but in 1892 their number had risen to 7,290,[131] and by 1905 to 13,128,[132] even though production had only trebled since 1859. The merchants' main business was therefore confined to purchasing peasant oil, bulking it and exporting it, and financing peasant production at high rates of interest. However, some also distilled substantial quantities of oil themselves from flowers bought from the growers and from their own small rose gardens.[133] The trade became increasingly interested in re-acquiring control over distilling capacity. In 1885, the Shipkov firm, then the leading Bulgarian rose-oil exporter, owned 28 boilers, but by 1889 owned 125.[134] In the 1890s some merchants were installing old-style stills but with capacities around 500 litres for production of 'own distillation' oil.[135]

After the turn of the century, the merchants attempted to extend their control over distilling by establishing industrial-scale distilleries. The earliest industrial distilling enterprises were set up by the French,

[127] Smith, 'Manufacture of Otto', p. 143.
[128] F. Kanitz, *La Bulgarie danubienne et le Balkan. Etudes de voyage (1860-1880)*, (Paris 1882), p. 177.
[129] A. Papazov, 'Distilatsija na rozovoto maslo, v'pros't za kontsesijata i d'rzhavnija kontrol pri distilatsija', *Prva konferentsija v'rhu rozovata industrija*. (Plovdiv 1906), p. 29.
[130] Anon. 'Manufacture of Otto', p. 266.
[131] Sawer, *Rhodologia*, p. 55.
[132] *P&EOR*, 22 (1931), p. 112.
[133] Bliznakov, *Rozovomaslenata ni industrija*, pp. 19-20; Manolov, *Poteklo*, p. 90.
[134] Topalov and Irinchev, *Rozoproizvodstvoto*, p. 43.
[135] Zarev, *Istorija*, p. 89.

but the initiative was in most cases Bulgarian, while the large-scale technology and the capital to finance it came from France. The technology was introduced into Bulgaria between 1902 and 1905 by three French enterprises. The first industrial distillery was set up by Pierre Chier of Grasse in 1902. He was brought to Karlovo by local rose-oil merchants, Slavi Mitov, with whom he went into partnership to set up a water distillery at Karlovo using indirect steam heat. However, his venture failed and Chier was ruined.[136] The causes of failure were, however, organizational and technical, and therefore remediable. Supply was no problem: the factory was overwhelmed with more rose supplies than it could distill,[137] and half the flowers contracted were lost. This was possibly because the equipment malfunctioned, owing to defective boiler design. Conceptually, however, the venture was sound, and in 1905 the distillery passed into the hands of Louis Montaland of Lyon. Montaland replaced part of the equipment, after which the plant was run more successfully.[138] The distillery was subsequently bought by the old-established Batsurov rose-oil firm, which expanded it.[139] Despite the failure of Chier's venture, and initial derision of industrial distilling by foreign merchants, it was speedily followed by similar projects, mainly launched by Bulgarian merchant interests.[140] In 1904 a Paris-based public company: 'Distilleries françaises de la Vallée de rose' built a rose-oil factory at Kirnare in Karlovo district. This company was, despite its name, a Bulgarian venture, formed by Batsurov's to raise the finance needed from French investors.[141] The company invested about 200,000 francs in installations for a steam distillery in Karlovo district.[142]

[136] Vasil Aleksandrov, *Iz istorijata na grad Karlovo*, (Sofia 1938), p. 6; Stefanova, *Rozovoto maslo*, p. 10; Papazov, 'Distilatsija', p. 30.
[137] Aleksandrov, *Karlovo*, p. 6.
[138] Irinchev *et al*, *Rozoproizvodstvoto*, pp. 76, 77.
[139] Irinchev *et al*, *Rozoproizvodstvoto*, pp. 76, 77; Iv. P. Manoloff (Manolov), *The Produce and Trade of Otto of Roses*, (Sofia 1907), p. 5; Idem, 'Polozhenieto na rozovata industrija i sv'rzanite s' nega v'prosi', *Prva konferentsija v'rhu rozovata industrija*, (Plovdiv 1906), p. 14.
[140] Vasil Aleksandrov, 'Rozovata industrija v Karlovska okolija', *SpBID*, 9 (1905), p. 337; Bliznakov, *Rozovomaslenata ni industrija*, pp. 19-20.
[141] Manolov, *Produce and Trade*, p. 5; Bliznakov, *Rozovomaslenata ni industrija*, p. 19.
[142] Papazov, 'Distilatsija', p. 30.

The distillery, built by a French engineer, was of admirable construction. Batsurovs later seem to have bought the factory outright.[143]

The only venture in Bulgaria of purely French origin was that of Charles Garnier, who in 1902 established a test plant near Karlovo, not for rose oil, but for rose concrete. Garnier's own experiments in France had, at last, provided a viable means of replacing the 'very cumbersome' maceration process. His system dissolved the oily and waxy parts of the flower in odourless petroleum ether. The solvent was then distilled off at low pressure and temperature, leaving a solid residue of rose concrete. A laborious and expensive process was still needed to remove the plant wax and obtain rose absolute.[144] As rose-concrete extraction, like rose-oil distilling, was not dependent on the labour skills of the Midi, Garnier was drawn to Bulgaria in pursuit of the cheapest raw materials.[145] Satisfied with the results, he established a permanent factory the following year, using equipment of his own design. He re-processed the output to rose-absolute in one of his factories in France.[146] By 1925 about 75 percent of the French rose crop was converted into rose-concrete,[147] but this technology was not taken up by other businesses in Bulgaria till 1924, when Bulgarian merchant houses set up two more factories.[148] It never consumed a significant fraction of the crop.

In 1905 other new industrial rose oil distilleries were established in Bulgaria. A. Papazov, perfumer of Plovdiv, set up a steam distillery in Karlovo,[149] and D. Papazoglu of Kazanl'k started a distillery which distilled with water rather than with steam, and added facilities for making pomade in 1906.[150] The Hristo Hristov firm founded a well-equipped steam distillery for its so-called 'Grasse' oil.[151]

[143] Irinchev *et al*, *Rozoproizvodstvoto*, p. 79.
[144] *P&EOR*, 16 (1925), pp. 319, 340.
[145] Allegedly, he could obtain roses in Bulgaria at about 1/30 of their price in France. See *Rozoproizvoditel*, (Kazanl'k), 25 Jul. 1922, p. 2, col. 3.
[146] *P&EOR*, 5 (1914), p. 134; Irinchev *et al*, *Rozoproizvodstvoto*, p. 77; *P&EOR*, 16 (1925), p. 314.
[147] *P&EOR*, 16 (1925), p. 318.
[148] *P&EOR*, 16 (1925), pp. 306, 314, 315.
[149] Manolov, *Produce and Trade*, p. 5.
[150] Manolov, 'Polozhenieto', p. 15.
[151] Manolov, 'Polozhenieto', 15; *Idem*, *Produce and Trade*, p. 6; Irinchev *et al*, *Rozoproizvodstvoto*, pp. 79-80.

The industrial distilleries varied considerably in their technology. Some merely deployed batteries of enlarged traditional stills, but with better condensers. Some installations were designed to distill by direct application of steam. Others isolated their boilers from the direct heat source by surrounding them with steam jackets. The intention was to avoid scorching the flowers which came into contact with the wall of the boiler.

These investments were less profitable than their projectors had hoped. Unlike the distilleries in the Midi, which processed a range of floral products, those of Bulgaria had only roses to distill. Papazov reckoned that big distilleries were too capital-intensive to justify operating for a crop which only used their capacity for one month in a year. Later efforts to overcome this problem by introducing other distillation crops such as lavender and mint were never very successful. Still, the problem might not have been insuperable had the new stills been run to capacity during the rose season. This was difficult. The effective catchment area for a distillery was small,[152] because of the slow speed of cart transportation and the rapid deterioration of flowers in transport, so in 1905 the three new distilleries processed only 5 percent of the rose harvest.[153] Moreover, the demand for oil was brisk before 1914, and the industrial distillers encountered resistance from the growers, who wanted to gain the value-added by distilling rather than sell their flowers. The supply shortfall for a time caused businessmen to hold off from building distilleries or taking up shares offered by various flotations. In common with other recently-founded distilleries, Batsurovs were overwhelmed by the cost of their overheads in relation to their meagre throughput. This led to lobbying by existing distilleries for local monopolies which would prevent competing distilleries from being erected.[154]

The industry became disenchanted with the more advanced systems, and reverted to relatively minor modifications to peasant

[152] *P&EOR*, 8 (1917), p. 127.
[153] Calculated from data in Manolov, 'Polozhenieto', p. 14.
[154] Manolov, 'Polozhenieto', 18-19; Papazov, 'Distilatsija', p. 30.

technique.[155] Papazov's settled from the start for importing 'the cheapest and commonest steam alambic', to minimise fixed costs. Papazov wanted to propagate the techniques he was using, by opening his works to other distillers, and demonstrating its low capital cost. By his own telling, this led to a large number of orders for similar equipment.[156] The initial drive for direct steam distilling was later found to have been mistaken, because it scorched the flowers and produced a flat odour.[157] Batsurov's distillery also used steam. Its oil yield was the best among the factories, but their product was inferior to that produced by water distilling.[158] This nullified the primary purpose of the investment. It is notable that Hristov's were subsequently to abandon the steam system, and to use direct fire.[159] The old-established Orozoff and Papazoglu firms,[160] and the newer but powerful firm of Bonchev and Kidov all constructed their distilleries on the old direct fire process,[161] though the Papazoglu company also built a French-designed direct steam distillery in 1925.[162] Most factories (by 1930) had reverted to distilling roses mixed with water, heated by a beech or willow fire, exactly as the peasants did, only on a larger-scale and with better controls.[163]

The shift away from the most advanced technology reflects the fact that concentration of production was not aimed at lowering production costs. On the contrary, large scale distilling raised them. The big stills gained fuel and labour economies, but in 1924 their yield of oil per kg. of roses was lower, on balance raising the cost of production.[164] In 1927 the peasant stills obtained a 19 percent higher yield of oil per kg. than the big distilleries, in 1928, 31 percent and in 1929 15 percent, allegedly because the flowers they distilled were picked earlier and were fresher than those processed by the factories.[165] (While the

[155] Irinchev *et al*, *Rozoproizvodstvoto*, p. 83.
[156] Papazov, 'Distilatsija', p. 30.
[157] *P&EOR*, 21 (1930), p. 260.
[158] Manolov, 'Polozhenieto', p. 16; Irinchev *et al*, *Rozoproizvodstvoto*, p. 79.
[159] Irinchev *et al*, *Rozoproizvodstvoto*, p. 79.
[160] Manolov, 'Polozhenieto', p. 15.
[161] Irinchev *et al*, *Rozoproizvodstvoto*, p. 80; Bonchev, 'Rose Industry', p. 266.
[162] *P&EOR*, 16 (1925), p. 307.
[163] *P&EOR*, 21 (1930), p. 260.

Bulgarians were moving towards the big still, distillers in France were moving in the opposite direction, towards the use of portable stills).[166] The productivity difference was so large, however, that it probably also reflected a higher degree of falsification in the peasant oil.

This goes to the heart of the matter. From the beginning of the XXth century, the merchants faced a storm of criticism from French and German perfumers over adulteration.[167] They feared that the impurity of the otto they obtained from the peasants and petty dealers threatened market confidence, and caused the rising 'preference' for cheaper 'synthetics'.[168] So they established or invested in large-scale distillery ventures solely in order to control the distilling process.[169] This enabled them to offer buyers 'own distillation' otto at a premium over that marketed as 'pure otto' of peasant provenance.[170] Buyers would be assured it was of superior quality and (hopefully) uncontaminated. In this the merchants succeeded. Chier, despite the failure of his venture, obtained a price for his product in France 50 percent higher than that paid for ordinary Bulgarian rose oil.[171] Batsurov's, who had kept in touch with distilling methods in Europe, launched their enterprise 'because of low fineness and lack of economy of the old Bulgarian process, and adulteration which damaged its reputation.'[172] So the trade emphasised the superior quality of the product of the large-scale distillery[173] to justify the premium 'own distillation' oil commanded.

The merchants bought all the flowers for their new stills from the growers. Before World War 1, however, despite the flurry of

[165] Enu Bontcheff, 'The Otto of Rose Situation in Bulgaria', *P&EOR*, 15 (1924), p. 433; W H. Simmons, 'Otto of Rose from the Analyst's Point of View', *P&EOR*, 16 (1925), p. 342.
[165] *P&EOR*, 18 (1927), p. 250. For 1928 and 1929 crop statistics see *P&EOR*, 19 (1928), p. 264 and 20 (1929), p. 229.
[166] Umney, 'Perfumery', p. 50.
[167] Manolov, *Produce and Trade*, p. 7.
[168] Bonchev, 'Rose Industry', p. 267.
[169] Aleksandrov, 'Rozovata industrija', p. 337-8.
[170] *P&EOR*, 6 (1915), p. 360.
[171] Papazov, 'Distilatsija', p. 30.
[172] *P&EOR*, 16 (1925), p. 309.
[173] Bliznakov, *Rozovomaslenata ni industrija*, p. 26.

business interest in establishing distilleries, most otto continued to be produced in peasant stills. Despite the growth of large-scale distilling the number of small stills increased, if anything, from 13,128 in 1905 to around 14,500 estimated in 1912.[174] The more substantial peasant producers possessed stills and did not want to sell their flowers, foregoing the value-added by distilling. In the boom conditions (and short harvests) on the eve of World War 1, the merchants could not indulge in the luxury of freezing out the peasant distiller. On the contrary they engaged in 'almost senseless competition' not only for flowers but also for otto of peasant provenance, which commanded an 'equivalent' price, 'entirely disproportionate to its value.'[175] That year, it was reported, premium oil was selling in London at 60s, compared with peasant oil, 50-55s[176]- not a margin sufficient to justify large -scale distilling.

After World War 1, however, large-scale distillation rapidly assumed dominance. The number of small copper stills in about 1918 was maintained at around 15,000, even though many had been requisitioned by the army.[177] But by 1921 their number had abruptly declined to about 4,000, and by 1927 there were only about 2,300 of them left. In 1932, 314 petty distillers worked with 1,215 stills.[178] Conversely, the number of factory distilleries climbed from 12 in 1922 to 36 in 1926 and 38 in 1927.[179] In 1931, 32 distilleries held privileges, (of which 25 were working) and at the time of nationalization, in 1948, there were 55, (excluding co-operatives) and 8 rose-concrete extraction plants.[180] In 1922, 38.7 percent of the oil was produced by large-scale distilleries and by 1927, they processed 70.3 percent of it.[181]

[174] Bonchev, 'Rose Industry', p. 266.
[175] Umney, 'Perfumery', p. 53.
[176] *P&EOR*, 3 (1912), p. 192.
[177] Zlataroff, *La rose*, p. 25; Duhovnikov, *Rozovata kultura*, p. 13.
[178] Karavanevski, *Rozovata ni kultura*, p. 38; K. Georgiev, *Maslodajnata roza*, p. 53; Bliznakov, *Rozovomaslenata ni industrija*, p. 18.
[179] Stefanova, *Rozovoto maslo*, p. 11; K. Georgiev, *Maslodajnata roza*, p. 53.
[180] Bliznakov, *Rozovomaslenata ni industrija*, p. 25; Irinchev *et al*, *Rozoproizvodstvoto*, pp. 107-9.
[181] *P&EOR*, 14 (1923), p. 276; K. Georgiev, *Maslodajnata roza*, p. 54.

Various reasons are attributed for the rapidity with which small-scale production was displaced. After the war, the soaring price of copper for munitions reportedly caused large numbers of stills to be sold off for scrap. Briefly, distilling capacity fell seriously short of the volume of flowers to be processed.[182] According to this logic, growers therefore had little option but to deliver flowers to the big distilleries. However, the scrapping of small stills cannot have lain simply in the attraction of their scrap value, for by 1926 it was estimated that about 30 percent of the existing stock of stills was no longer functioning.[183] Another reason for the elimination of small-scale distilling, mentioned only in passing in the literature, but probably of greater significance, was the availability after the war of transport by vans and light lorries which expanded the catchment area of the factories to a 20-30 km. radius, even though the inadequacy of road transport was still regarded as a disadvantage for large-scale distilling as late as 1934.[184]

Of more importance than either of these reasons was the widening premium commanded by 'own distillation' oil. According to one source of 1921, factory rose oil commanded 4-5,000 leva per kg more than peasant oil,[185] at a time when the average price realized by oil exports was 18,800. This margin would have made it less worthwhile than hitherto for growers to distill their own flowers. Western purchasers remained sceptical as to whether 'own distillation' otto was free of adulterants. Leading authorities continued to debate whether or not it was adulterated as late as 1932.[186] However, although still far from perfect, their analytical tools for identifying falsification were improving, making adulterated otto more difficult to sell.[187] This caused the distillers to reduce or eliminate falsification in their own brands, for they needed to maintain consumer confidence to secure the premium on which the viability of large-scale distilling depended.

[182] Duhovnikov, *Rozovata kultura*, p. 13.
[183] Zlataroff, *La rose*, p. 25.
[184] Bliznakov, *Rozovomaslenata ni industrija*, pp.26, 27; *P&EOR*, 16 (1925), pp. 297, 305.
[185] Duhovnikov, *Rozovata kultura*, p. 8.
[186] Ernest Parry, 'Otto of Rose', *P&EOR*, 23 (1932), p. 345, W A. Poucher, 'Pure Rose Otto', *P&EOR*, 23 (1932), p. 375.
[187] *P&EOR*, 2 (1911), p. 90.

Some of their oil was, indeed, adulterated, but to an extent which critics exaggerated. At the Bulgarian rose-research establishment, scientist Mara Stefanova tested 120 samples of merchant rose oil, 'mostly' produced in large-scale distilleries, from 1921 onward, against samples prepared under her own supervision. She concluded that 18 of the samples contained impurities.[188]

Peasant distilling diminished further by the late 1920s. During these boom years, the trade over-invested in new distilling capacity, and failed to take account of the inelasticity of flower supply. The growers were becoming increasingly well-organized in bargaining collectively, so to secure sufficient flower throughputs distillers competed in offering them attractive advance contract terms.[189] This must further have diminished the margin on the product of 'own crop' distillation, for the importers entertained the gravest of doubts over peasant oil, encouraged by the Bulgarian merchants, who vigorously denigrated it as impure.[190]

They had a case. For the dwindling band of independent grower-distillers, one motive seems to have been the opportunity on-farm distilling still afforded of adulterating their crop by sprinkling the petals, not with palmarosa now, but with geraniol, a means of falsification difficult to detect.[191] Others sprinkled with citronellol (from Java citronella) which was still cheaper than geraniol, and still less easily detectable.[192] These small distillers faced increasing pressures from the merchants to reduce adulteration. The merchants (allegedly) avoided buying in villages notorious for falsification.[193] They had good cause, for in 1927, consumers were reported to be buying only the finest oil, and dropping the use of 'made-up cheap grades.'[194]

[188] M. Stefanova, *Izsledvanija v'rhu nasheto rozovo maslo.* Reproduced from *Himija i Industrija*, 7 (1936), p. 16.
[189] *P&EOR*, 18 (1927), 250; 19 (1928), p. 264; 20 (1929), pp. 229, 493; 21 (1930), p. 252.
[190] Karavanevski, *Rozovata ni kultura*, p. 38.
[191] Nikola Todorov, *Dobivane na eterichni masla v B'lgarija - izsledvane i prilozhenie v farmatsijata*, (Sofia 1943), p. 60.
[192] *P&EOR*, 23 (1932), p. 345.
[193] Duhovnikov, *Rozovata kultura*, p. 11.
[194] *P&EOR*, 18 (1927), p. 249.

The crisis of the 1930s

Not surprisingly, the relationship between the grower and the merchant became increasingly politically charged. The conviction on the part of the village elites that they were being exploited by merchant business practices gave rise from 1900 onwards to the formation of rose-grower co-operatives.[195] In the early years these co-operatives were weakly organized, transient and undercapitalized, but they were drawn along by the mainstream of the peasant co-operative movement, through which they acquired political influence. The conversion of the rose-oil merchant into industrialist intensified antagonism, especially after World War 1. When they had produced oil, growers could hold it off the market in the hope of a higher price, but flowers had to be disposed of immediately. It was therefore easy to raise an outcry against the merchants, and for the co-operative movement to press its case for privileges to assist the spread of co-operative distillation.

Under the peasantist Stamboliski government in 1922, a law was formulated which would place oil production and trade in the exclusive hands of the co-operatives.[196] In 1923, Stamboliski was overthrown by a coup and assassinated. The political threat to the merchants receded. However, the coup was caused mainly by foreign policy issues, rather than by Stamboliski's promotion of co-operatives, and his successors declined to dismantle the institutions of the Stamboliski era. They continued to favour agriculture and, in particular, co-operative agrarianism.[197] In the rose trade, co-operative distilleries enjoyed cheap credit through the state agrarian bank, B'lgarska zemledelska banka (BZB)[198] and the co-operative movement greatly extended its influence and activity.

By the 1930s, the good years for the rose industry had passed, forever. The slump was to hit Bulgarian rose growers ferociously, but

[195] Bliznakov, *Rozovomaslenata ni industrija*, p. 27.
[196] *Ibid.* p. 28.
[197] John R Lampe, *The Bulgarian Economy in the Twentieth Century*, (Beckenham 1986), pp. 58-60.
[198] Chobanova, 'Rozoproizvodstvoto', p. 273.

it arrived late, possibly because of the continued buoyancy of French markets in 1930. The most common commercial arrangement for contracting flower supplies was for the grower to undertake, in return for an advance, to deliver flowers at a price to be fixed just before the harvest. At the end of it he received half their value, and would be paid the balance at the end of the year.[199] If the rose-oil market broke after the flower price fixing, as seems to have happened in late 1930, the distillers could be caught with heavy losses. Between 1930 and 1931 rose oil slumped from 110,960 leva per kg. to 64,223. This led to the bankruptcy of at least one major distiller, the Botju Mitov firm, with large unpaid debts to rose growers.[200] Even growers unaffected by insolvencies were to suffer, for the price of oil continued to slide to 41,407 in 1932, and the price paid for their roses collapsed from 22 leva per kg. in 1930 to 7 leva in 1931 and in 1932.

These events brought about interventionist legislation, whose character the co-operative movement was strongly placed to shape. Organized peasant opinion was convinced that the merchants were the primary source of falsification, and claimed that all co-operatively distilled oil was pure. So it pressed for all phases of production and sale to be brought under the co-operative umbrella, freezing the merchant manufacturers out of the business. In practice the new regulations quickly turned the industry into a state-controlled monopoly. Initial policy measures were directed to supporting prices, without cutting production. In 1932, the price paid to producers for flowers and the allocation of flowers between distillers was brought under the control of BZB. The purchasing firms had to turn over to the bank the sum they expected to lay out for flowers and the bank then guaranteed payment to producers (50 percent cash down and 50 percent at the end of the year). The bank was also accorded the right to rent distilleries and distill flowers which had not been

[199] Bliznakov, *Rozovomaslenata ni industrija*, pp. 14, 29.

[200] Losses to producers are variously stated at 'over 2 million leva' and 70 million leva. G. Dikov, 'Konferentsijata na rozoproizvoditelite', *Kooperator*, 14 Mar. 1936, p. 1; Irinchev *et al*, *Rozoproizvodstvoto*, p. 96; Bliznakov, *Rozovomaslenata ni industrija*, p. 29; Chobanova, 'Rozoproizvodstvoto', p. 272.

purchased. In 1933 a further law provided that the output of the co-operative distilleries was to be sold either by the BZB or by the General Union of Co-operatives. The sale of flowers on credit was prohibited.[201] Even though co-operative distilling was backward and technically inefficient, the laws of 1932 and 1933 gave it an effective monopoly. Whereas the co-operatives had distilled 15.3 percent of the crop in 1930, and the commercial distillers 73.3 percent, in 1933 the co-operatives distilled 96.5 percent, mainly by taking the commercial distilleries on lease.[202]

The 1932 and 1933 laws did not stabilize the market. Flower prices, though centrally fixed each year, continued to decline, to 5 leva per kg. in 1933, and in 1936 to a nadir of 3.66. A new law followed in 1935. One of its aims was to suppress adulteration, so distilleries were to be policed by state controllers. As small stills could not be policed, cultivators were forbidden to distill their own crop.[203] The BZB was given a flower purchase monopoly; independent flower purchasing was forbidden. The bank was to fix the amount to be distilled, and allocate the flowers between the co-operatives and those private distilleries it chose to recognize. Any surplus not required by the co-operatives and the merchants was to be distilled for the account of the bank.[204] The government also vested control of the export trade in rose oil in BZB. Merchants had to declare their stocks and lodge them with the bank. They could only export such amounts of oil as the bank permitted them to purchase from it, and they had to sell it abroad at a price fixed by a commission.[205] The commission fixed this price too high for the market to clear. Dissatisfied by this outcome, the bank tried to by-pass the merchants in 1935 by sending its own representative abroad to sell oil independently of the exporters,[206] and in 1938 it tried to establish its own selling organization abroad.[207] These

[201] Irinchev *et al*, *Rozoproizvodstvoto*, p. 96.
[202] Bliznakov, *Rozovomaslenata ni industrija*, pp. 28, 30, 31.
[203] *P&EOR*, 26 (1935), p. 309.
[204] Irinchev *et al*, *Rozoproizvodstvoto*, p. 97.
[205] *P&EOR*, 26 (1935), pp. 309, 336.
[206] Plovdivska t'rgovsko-industrialna kamara, *Godishnik 1935g.* (Plovdiv 1936), pp. 27-8.
[207] *Idem*, *Godishnik 1935g.* pp. 27-8; *Godishnik 1938g*, (Plovdiv 1939), p. 65.

efforts at raising the price at which rose oil sold abroad appear to have been ineffective.

There was no corresponding reduction in rose-oil supply. On the contrary, the area cultivated with roses increased between 1930 and 1932, and the crop still more. In 1935 rose cultivation reached a peak, at 7,300 hectares. The BZB continued 'lavishly' to extend credit to the rose-producer co-operatives.[208] Their oil therefore accumulated in the bank's warehouses, or was advanced to other banks as security for loans. The stockpile rose inexorably. Between 1930 and 1935, 14,500 kg of oil were produced but only 6,500 kg. were exported, and by the end of 1936, unsold stocks at the BZB warehouses had accumulated to 8,000 kg or more.[209] The cost of this was borne effectively by the state.

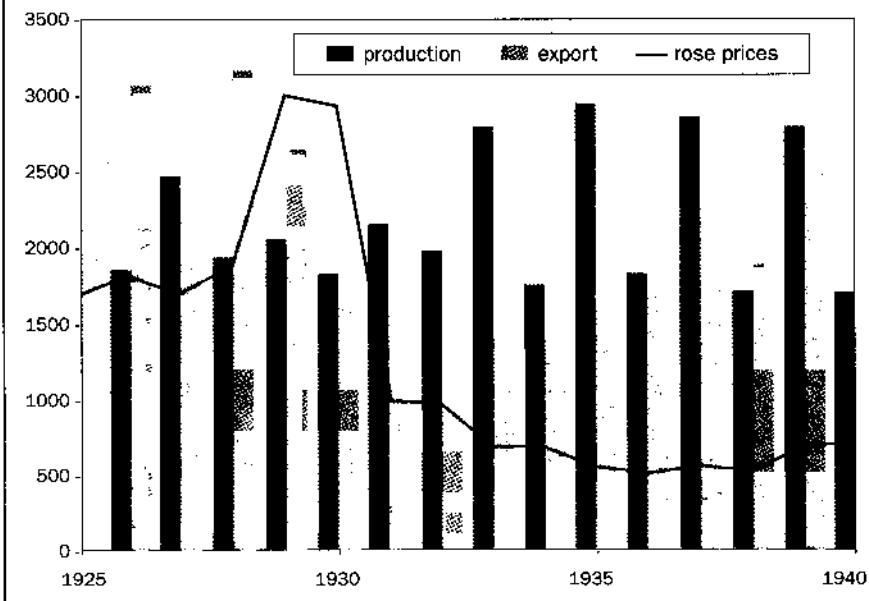
As a result, the 1935 law tried to address the problem of over-production, rooted in the classic inability of primary producers to exit without assistance. Permission had to be obtained for new plantings, and compensation was to be given for uprooting. This law was soon amended to prohibit the planting of new gardens or the 'rejuvenation' of old ones.[210] In response, the planted area fell in 1936, and a weak harvest caused exports to be balanced with current production. Nevertheless, the average flower crop in 1930/39 was 57.2 percent larger than it had been in the 1920s, and the 1936 cutback was not sustained. The influence of the co-operative movement probably diluted the effectiveness of the uprooting scheme, for it was intensely suspicious towards such programmes, and would not countenance compulsion. Its attitude to uprooting, coupled with antagonism towards the merchants, is illustrated by the angry cartoon of 1936 reproduced above (p. 571).[211]

In 1937, a further voluntary uprooting law was announced, but by then uprooting seems to have ceased.[212] So in 1937, output again far

[208] Bliznakov, *Rozovomaslenata ni industrija*, p. 28.
[209] Bonchev, 'Rozovata industrija', p. 5.
[210] Irinchev *et al*, *Rozoproizvodstvoto*, p. 97.
[211] The issue of *Kooperator* (Sofia), of 14 Mar. 1936 was devoted to the problems of the rose growers and their suspicions of the uprooting programme.
[212] *Iskra*, 30 Apr. 1937, p. 4; Irinchev *et al*, *Rozoproizvodstvoto*, p. 98.

exceeded exports.[213] In 1938 the government reacted by re-instating crop-reduction measures, offering a premium of 500 leva per hectare of roses uprooted.[214] The 1938 harvest was weak, but even so this only reduced the stockpile marginally, and so far from declining in response to uprooting incentives, hopes of a market revival caused a renewed rise in the area cultivated with roses. So despite the mild recovery in the world market in the late 1930s, the accumulation of stocks prevented the bank from conceding producers more remunerative prices. Figure 2 tracks production, exports and flower prices between 1925 and 1940. If the prices paid for rose flowers were deflated by the cost of living in Bulgaria, an index (where 1914 and, co-incidentally, 1926 =100) would show 'real' flower prices rising from 37 in 1922 to 199 in 1930, then falling inexorably to 27 in 1935 and recovering to 58 by 1939.

FIGURE 2 - Bulgaria's rose trade and the slump
Rose production, export and flower prices 1925-1940



For data and sources, see appendix.

[213] *Iskra*, 15 Apr. 1938, p. 3.
[214] Topalov and Irinchev, *Rozoproizvodstvoto*, pp. 30-31.

The regulations of 1932-37 aimed to improve conditions for the (co-operative) small producer, but they were distorted by seeking to apportion 'blame' for the difficulties in which the growers found themselves. Sophisticators and merchant distillers (too often equated) were favourite targets. Growers themselves were coerced into the co-operative fold by depriving them of the right to distill, or even to market their flowers independently. An underlying assumption was that prices could be raised or at least maintained by exploiting Bulgaria's monopoly power on the international market, but this overlooked the dwindling market significance of rose oil to the perfumers that resulted from the advances in synthetics.[215] The Bulgarians preferred to believe that the consumers of essential oils would suffer from their error in substituting the natural product. French perfumers, it was claimed, were acting short-sightedly in response to the diminution of demand by cutting back on Bulgarian rose oil, and cheapening their products with 'counterfiet perfumes', a strategy which was losing them their overseas clientele.[216] A retrospective account blames Nazi Germany for undermining Bulgarian rose growing so as to expand the market for 'cheap German chemical Ersatz', and the uprooting programme, which displaced roses with strawberries and potatoes, was probably influenced by Germany's drive to reorientate Bulgaria towards producing the commodities it wanted to import.[217] The period of prosperity between 1925 and 1930, when increasing use of synthetics seemed if anything to strengthen the demand for the natural product, would not return. There would remain a small (and conservative) market for high-price perfumes which did require use of the natural product, but even in this market rose oil was not necessarily the input of choice. For most purposes, rose-absolute was superior, but little of this was sought from Bulgaria.

[215] In the 1920s the *Perfumery and Essential Oil Record* was full of reports on Bulgarian rose cultivation, but by the later 1930s, the subject received only occasional mention.
[216] K. D. Spisarevski, 'Krizata v t'rgovijata na rozovoto maslo', *Mir* (Sofia 21 Aug. 1937), p. 5.
[217] Topalov and Irinchev, *Rozoproizvodstvoto*, p. 30; Zarev, *Istorija*, p. 124.

Moreover Bulgaria's monopoly even in natural rose oil remained contestable. Instead of disappearing during the depression, Turkish production was energetically promoted by government.[218] Although its export was still much smaller than Bulgaria's, Turkey exploited Bulgaria's rigid pricing policy by undercutting it.[219]

Conclusion

Bulgaria's 'rose valley' produced a high-price raw material for a luxury product for which international demand expanded briskly up to World War 1. It enjoyed a near monopoly in its supply. However, the high price of rose oil invited adulteration with cheaper essential oils. Purchasers had few means of substituting it, so the rose-oil trade enjoyed modest prosperity and expansion, despite a tendency for productivity to decline. Inevitably there were short-run fluctuations, and the 'extensive' system of rose growing from the time of Bulgaria's liberation retarded its progress.

Adulteration is a common problem with primary products. Even the lowly palmarosa oil with which rose oil was adulterated was itself contaminated with the still cheaper Indian gurjun.[220] Chemical analysis seemed to provide the key to defeating the sophisticator, but paradoxically, it was also the means by which the user could substitute synthetics for the natural product. This did not immediately disequilbriate the rose-oil market, because good floral perfume could not be made purely from 'synthetics', and partial substitution lowered perfume costs and widened its market. But this was only a transitional phase. Chemical synthesis emancipated perfumers from the limits of the conventional range of floral odours. Synthetic odours took an increasing market share, gradually marginalizing the expensive natural floral scents.

The Bulgarian rose-oil merchants became aware that, with controlled synthetics at their disposal, buyers would decreasingly

[218] Sacv, 'V'nshnata ni t'rgovija', pp. 32-3.
[219] Konstantin Georgiev, 'Rozite prez 1939 v nas i drugade', *Iskra*, 30 Jun. 1939, p. 2.
[220] Piesse, *Art of Perfumery*, p. 35; *P&EOR*, 3 (1912), p. 287; Martin, *Perfumes*, p. 30.

tolerate adulterated natural raw material, since they wanted the trace constituents that neither they nor the falsifier could replicate. They were therefore willing to pay a premium for unadulterated material, if confident that, such a premium would secure it. The merchants calculated that, in the absence of satisfactory testing techniques, control over distillation would enable them to offer (relatively) pure rose oil, and secure the premium. So they invested in the large-scale technology. As techniques for detecting falsification advanced, confidence in 'own distillation' oil raised the premium it commanded over peasant oil. In the 1920s the 'own distillation' premium allowed distillers to offer the growers flower prices high enough to squeeze the margin on peasant-distilled oil, forcing most growers to sell their flowers. Yet large-scale distilling was less efficient, and did not intrinsically guarantee a superior oil.

So by the later 1920s, adulteration had ceased to be a major problem for purchasers of 'own distillation' oil. True, peasant oil was becoming even more contaminated than hitherto, but the purchasers avoided it. Supply-side weaknesses in Bulgarian rose growing prevented the market from being overloaded, so the loss of market share by the natural product was concealed by the rise in prices.

During the slump, however, both these benign but transient influences were stripped away. Growers were badly hurt both by merchant defaults and by the slump in prices. The rose growers' co-operative movement fostered antagonism among the growers towards the merchants, because of the destruction of on-farm distilling. Thus the slump engendered a political response, which made the merchants scapegoats for the growers' ills. The result was government fixing of prices, and co-operative control over distilling. As neither measure brought apparent relief to the growers, the industry needed to shrink, but the 1935 legislation on uprooting was largely ineffective.

This is not to say that a better alternative was at hand. Left to the market, the price paid to the rose producer would have fallen even further, without giving much stimulus to demand. The entire adjustment would therefore have had to be borne on the supply side, with even more distressful consequences.

Yet the industry still enjoyed a limited longer-term prospect. Rose oil production was resumed during the Communist era. The oil was sold only on a modest scale on the international perfumery market compared with the volume marketed in its heyday.[221] After World War 2, few perfumery products in mass commerce, even those expressly rose-scented, contained any otto at all, but it was still used in certain very high-priced preparations. Bulgaria lost its former world-market dominance in the trade, but Soviet purchases and those of a few firms, especially Chanel, would continue to support it. In 1963-66 the Soviet Union itself emerged as the biggest producer with 53 percent of world production, but used its output domestically.[222] The French increasingly secured their rose -oil requirements by investment in Turkey, whose annual export in 1972 and 1973 averaged 2,778 kg., compared with Bulgaria's annual output of 1,190. By 1985 Turkish exports attained 8,355 kg.[223] After 1979, Bulgaria stopped releasing production data, probably because the industry was in rapid decline. In several years production entirely ceased. As the contrasting Turkish experience demonstrates, Bulgaria's misfortune cannot solely be attributed to contraction of international market demand. Under changed institutions, the Rose Institute at Kazanl'k is therefore hoping to revive production.[224]

[221] Irinchev *et al, Rozoproizvodstvoto*, pp. 140, 159 give Bulgaria's annual rose oil production during the 1960s and 1970s at 1,149 kg. and 1,391 kg. - compared with 3,438 kg. in the 1900s.

[222] Topalov and Irinchev, *Rozoproizvodstvoto*, p. 23.

[223] Republic of Turkey, *Dis ticaret yillik istatistik Seri: 1/ Annual Foreign trade Statistics*, Series 1, 1972 p. 849 and 1973; *Dis ticaret istatistikleri* 1985, p. 906. Bulgarian statistics for 1972 and 1973 are taken from Irinchev *et al, Rozoproizvodstvoto*, pp. 159.

[224] Kos'o Zarev was kind enough to discuss recent and current trends when interviewed by me in Kazanl'k, September 1997.

APPENDIX

year	oil output	concrete output	:sources (oil)	::sources ::(concrete)
1832	576	-	:(1) p. 253.	
1835	1458	-	:(2) fo. 274.	
1836	972	-	:(3) fo. 171.	
1837	1296	-	:(4) fo. 189.	
1845	972	-	:(5) fo. 30.	
1848	972	-	:(6) fo. 41.	
1849	972	-	:(7) fo. 21 vo.	
1851	1346	-	:(8) p. 27.	
1854	1202	-	:(9) p. 506.	
1855	865	-	:(9) p. 506.	
1856	375	-	:(9) p. 506.	
1858	1440	-	:(10) p. 267.	
1859	1290	-	:(10) p. 267.	
1862	1920	-	:(1) p. 253.	
1863	1442	-		
1866	3041	-	:(1) p. 253; (11) p. 388; (12) p. 288.	
1869	2404	-	:(13) p. 1051.	
1871	2743	-	:(14) p. 52; (15) p. 189.	
1872	1038	-	:(14) p. 52; (11) p. 388.	
1873	1475	-	:(14) p. 52; (11) p. 610.	
1874	2600	-	:(14) p. 52; (11) p. 610.	
1875	2430	-	:(14) p. 52; (11) p. 610; (16) p. 640.	
1876	1880	-	:(14) p. 52; (11) p. 610; (17) p. 18.	
1877	2000	-	:(14) p. 52; (11) p. 610.	
1878	1525	-	:(14) p. 52; (11) p. 610.	
1879	1700	-	:(14) p. 52; (11) p. 610.	
1880	1550	-	:(14) p. 52; (11) p. 610.	
1881	1800	-	:(14) p. 52; (11) p. 610.	
1882	1950	-	:(14) p. 52; (11) p. 610.	
1883	1860	-	:(14) p. 52; (18) pp. 54-55.	
1884	1900	-	:(14) p. 52	
1885	1900	-	:(14) p. 52	
1886	2500	-	:(14) p. 52	
1887	1819	-	:(14) p. 52; (19) p. 573.	
1888	1873	-	:(14) p. 52; (19) p. 573.	
1889	2820	-	:(14) p. 52; (18) p. 57.	
1890	2400	-	:(18) p. 57; (18) p. 57.	
1891	1972	-	:(18) p. 56; (18) p. 57.	
1892	1324	-	:(18) p. 56; (18) p. 57.	

year	oil output	concrete output	:sources (oil)	::sources ::(concrete)
1893	1832	-	:(18) p. 56; (18) p. 57.	
1894	2025	-	:(18) p. 56; (18) p. 57.	
1895	2178	-	:(18) p. 56; (18) p. 57.	
1896	3010	-	:(18) p. 56; (18) p. 57.	
1897	3041	-	:(18) p. 56; (18) p. 57.	
1898	1828	-	:(18) p. 56; (18) p. 57.	
1899	2218	-	:(18) p. 56; (18) p. 57.	
1900	2380	-	:(20) p. 6.	
1901	2500	-	:(20) p. 6.	
1902	2068	-	:(20) p. 6	
1903	4076	-	:(21);(20) p. 6.	
1904	4236	-	:(21);(20) p. 6.	
1905	4300	30	:(21);(20) p. 6.	::(25) p. 14.
1906	4380	-	:(21);(20) p. 6.	
1907	3091	-	:(21);(20) p. 6.	
1908	3269	-	:(21);(20) p. 6.	
1909	4080	-	:(21);(20) p. 6.	
1910	2915	-	:(21);(20) p. 6.	
1911	3143	-	:(21);(20) p. 6.	
1912	2372	-	:(21);(20) p. 6.	
1913	3012	-	:(21);(20) p. 6.	
1914	3781	-	:(21);(20) p. 6.	
1915	3038	-	:(21);(20) p. 6.	
1916	3182	-	:(21);(20) p. 6.	
1917	2816	-	:(21);(20) p. 6.	
1918	1862	-	:(21);(20) p. 6.	
1919	1322	-	:(21);(20) p. 6.	
1920	1419	-	:(21);(20) p. 6.	
1921	1355	-	:(21);(20) p. 6.	
1922	1651	-	:(21);(20) p. 6.	
1923	1418	-	:(21);(20) p. 6.	
1924	1793	-	:(21)	
1925	1462	87	:(21)	::(21)
1926	1879	29	:(21)	::(21)
1927	2469	112	:(21);(22) p. 3.	::(21)
1928	1926	53	:(21);(22) p. 3.	::(21)
1929	2062	113	:(21);(22) p. 3.	::(21)
1930	1825	10	:(21);(22) p. 3.	::(21)
1931	2172	1	:(21);(22) p. 3.	::(21)
1932	1994	2	:(21);(22) p. 3.	::(21)
1933	2808	0	:(22) p. 3.	::(21)
1934	1750	4	:(22) p. 3.	::(21)
1935	2947	24	:(22) p. 3.	::(24) p. 95.
1936	1812	313	:(22) p. 3.	::(24) p. 95.
1937	2850	204	:(22) p. 3.	::(24) p. 95.
1938	1690	231	:(23) p. 182.	::(24) p. 95.
1939	2800	9	:(23) p. 182.	::(24) p. 95.
1940	1690	210	:(24) p. 95.	::(24) p. 95.

year	oil output	concrete output	:sources (oil)	::sources ::(concrete)
1941	853	121	:(24) p. 95	::(24) p. 95.
1942	271	127	:(24) p. 95	::(24) p. 95.
1943	1163	202	:(24) p. 95	::(24) p. 95.
1944	773	0	:(24) p. 95	::(24) p. 95.
1945	850	0	:(24) p. 106	::(24) p. 95.

note: many of earlier data figures for rose oil are expressed either in (troy) ounces, or in muskals of 4.807 gmmes. For 1924-1934 the export figures for rose concrete are used as a surrogate for output.
Sources:
1). Report by Vice Consul Blunt on Kizanlik ... 1866.
2). PRO FO78 265, trade report, Adrianople, 2 Dec 1835.
3). PRO FO78 314, trade report, Adrianople, 12 Jan 1837.
4). PRO FO78 335, trade report, Adrianople, 8 Jan 1838.
5). PRO FO78 652, trade report, Adrianople, 31 Jan 1846.
6). PRO FO78 795, trade report, Adrianople, 12 Feb 1846.
7). PRO FO78 832, trade report, Adrianople, 20 Mar 1850.
8). Topalov & Irinchev, *Rozoproizvodstvoto.*
9). Hanbury, 'On Otto of Rose.'
10) Anon. 'Manufacture of Otto of Roses', *PJT*, 2nd Ser. 1 (1859-60).
11). Nicolas V Michoff, *Beitrage zur Handelsgeschichte Bulgariens.* II *Osterreichishe Konsularberichte*, 2 (Sofia, 1953).
12). Baur of Constantinople, 'On Attar of Rose.'
13. Anon. 'The Manufacture of Attar of Roses in Turkey', *PJT*, 3rd Ser. 2. (1871-72), citing Hochstetter; the report possibly relates to 1868.
14). Christoff, *L'industrie des roses.*
15). Edirne vilayet. *Salname* Defa 3, 1289 (1873).
16). 'Notes by Mr. Baring on the exports and imports etc. from the Sandjak of Phillipopolis', (Commercial no. 17, 1876) *Reports of H.M. Secretaries of Embassy and Legation on the Manufactures, Commerce & etc. of the countries in which they reside.* Part IV. (P.P. 1876 LXXIII. (1876).
17). Robert J. More, *Under the Balkans.* (London 1877).
18) Manolov, *Poteklo.*
19) Vasil'ov, T. 'Belezhki v'rhu v'treshnoto s'stojanie na B'lgarija prez 1888 *god.' Periodichesko spisanie*, 28-30 (Sofia, 1889).
20) Zlataroff, *La Rose.*
21) *SGBTs*, 1909, and sequential.
22) *Iskra* (Kazanl'k) 15 Apr. 1938.
23) *P&EOR*, 31 (1940)
24) Irinchev et al, *Rozoproizvodstvoto.*
25) Manolov, 'Polozhenieto.'

Data and sources for figure (ii)

year	oil output kg.	oil export kg.	flower price leva/kg.
1925	1462	2169	12
1926	1879	3065	12
1927	2469	2406	12
1928	1925	3157	13.5
1929	2062	2664	21.5
1930	1825	1752	21
1931	2172	1325	7
1932	1994	917	7
1933	2808	1413	5
1934	1750	1218	5
1935	2947	1671	4
1936	1812	1864	4
1937	2850	2179	4
1938	1690	1884	4
1939	2800	2541	5
1940	1690	2495	5

Sources:
Production: as for figure 1.
Exports: *SGBTs*, 1927, p. 234 and sequential.
Flower prices:
1925-26: K Georgiev, *Maslodajnata roza*, p. 7.
1927-37: *Iskra*, 15 Apr. 1938.
1938: *Iskra*, 15 May 1938, p. 3.
1939: *Iskra*, 30 Jun. 1939, p. 2.
1940: *SGBTs* 1941.