

THE GIFTS IF THE WISE MEN ON THE CURIOSITIES OF THE SUBSTANCES' ¹

Tuḥaf al-ḥawāṣṣ fī ṭuraf al-ḥawāṣṣ

Abū Bakr Muḥammad b. Muḥammad al-Qalalūsī (d. 607-707/1210-1307)

[Q I] – PREPARATION OF INKS (*MIDĀD*) THE FIRST OF WHICH IS THE BLACK ONE

[Q IA] *Extraction by boiling until a certain amount of water has evaporated (cooked)*

[Q I.1]

مِدَادٌ مَطْبُوحٌ:

يُؤَخَذُ مِنَ الْعَفْصِ أَرْبَعُ أَوْاقٍ وَمِثْلُهَا مِنْ حَبِّ الْأَثَلِ وَمِثْلُهَا مِنَ الصَّمْغِ الْعَرَبِيِّ وَيُدَقُّ كُلُّ وَاحِدٍ عَلَى جِدَّةٍ وَيُوضَعُ الْعَفْصُ وَحَبُّ الْأَثَلِ فِي إِنَاءٍ جَدِيدٍ لَمْ يَمْسَهُ دَسْمٌ مَعَ أَرْبَعَةِ أَرْطَالِ مَاءٍ وَيُرْفَعُ الْجَمِيعُ عَلَى النَّارِ حَتَّى يَذْهَبَ مِنْهُ النِّصْفُ وَيُلْقَى عَلَيْهِ الصَّمْغُ مَعَ أُوقِيَّةٍ وَنِصْفٍ مِنَ الزَّرَّاجِ وَيُغْلَى غَلِيَّتَيْنِ أَوْ ثَلَاثًا وَيُنزَلُ وَيُنْرَكُ حَتَّى يَصْعَدُ وَيُؤَخَذُ صَفْوُهُ وَيُسْتَعْمَلُ وَيُزَادُ عَلَى تَقْلِهِ الْمَاءُ وَيُطَبِّخُ حَتَّى تَرْضَى حَالَهُ وَيُنزَلُ وَيُنْرَكُ حَتَّى يَصْفُو وَيُؤَخَذُ وَيُسْتَعْمَلُ وَيُرْمَى النَّقْلُ.

Midād obtained by decoction:

Take four *ūqiyya* [132.42 g] of gallnuts, the same amount of tamarisk seeds and the same amount of gum arabic. Grind each ingredient separately and place the gallnuts and tamarisk seeds in a new container, not soiled with grease, with four *raṭl* [1589 mL] of water. Put everything on the fire until half of it has evaporated, then put the gum arabic with one and a half *ūqiyya* [49.66 g] of vitriol and boil a couple of times or three [taking it and putting it back on the fire], then remove it from the heat and leave it to rest until the clarified part rises [to the surface], then take its clear part and use it. You can add water to the sediment [of the ingredients left-over]: cook it until its state satisfies and take it off the heat; leave it to rest until clarified, then take it and use it. Finally, throw away the sediment.

[Q I.2]

مِدَادٌ آخَرٌ:

تَأْخُذُ مِنَ الْعَفْصِ مَا أَحْبَبْتَ وَتَدْقُهُ أَمْثَالَ الْحِمَّصِ وَيُلْقَى عَلَيْهِ عَشْرَةَ أَمْثَالِهِ مَاءً، وَيُحْمَلُ عَلَى نَارٍ لَيِّنَةٍ حَتَّى يَرْجِعَ إِلَى قَدْرٍ جُزْءَيْنِ ثُمَّ يُبْرَدُ وَيُصْفَى وَيُلْقَى عَلَيْهِ مِنَ الصَّمْغِ لِكُلِّ جُزْءٍ نِصْفٌ وَمِنَ الزَّرَّاجِ الْأَخْضَرِ مَا يَكْفِي وَيُسْتَعْمَلُ.

Another midād:

Take the quantity you desire of gallnuts and grind them as if they were chickpeas; add ten times the same amount of water, and put it on a low fire until it becomes two parts; then let it cool and clarify, and add for each part one and a half part of gum and enough green vitriol, then use it.

[Q I.3]

مِدَادٌ آخَرٌ:

تَأْخُذُ أُوقِيَّةَ عَفْصٍ وَتَدُقُّ عَلَى مَا وُصِفَ وَتُنْقَعُ فِي رَطْلِ مَاءٍ وَيُطَبِّخُ حَتَّى يَذْهَبَ مِنْهُ الثَّلَاثُ وَيُبْرَدُ وَيُصْفَى وَيُلْقَى عَلَيْهِ أُوقِيَّتَانِ مِنَ صَمْغٍ مَحْلُولٍ وَمِنَ الزَّرَّاجِ قَدْرٌ مَا يُرْضَى لَوْنُهُ، وَصَفَةُ الْقَاءِ الزَّرَّاجِ أَنْ يُنْقَعُ فِي الْمَاءِ الْعَدْبِ وَيُضْرَبُ بِالْيَدِ ضَرْبًا جَيِّدًا وَيُنْرَكُ حَتَّى يَنْزِلَ وَيُسْتَعْمَلُ صَفْوُهُ الْغَايَةَ فِي الرِّقَّةِ.

Another midād:

Take one *ūqiyya* [33.105 g] of gallnuts and grind them as described; immerse them in one *raṭl* [397.26 mL] of water and cook it until one third has evaporated, then let it cool and clarify; add to it two *ūqiyya* [66.21 g] of dissolved gum and vitriol in the amount to make a satisfying colour; the method for adding the vitriol consists in immersing it in clear water and slamming it vigorously with the hand, then leave it to rest until it settles and then use its clarified part which is the best on parchment.

[Q I.4]

¹ The Arabic version is based on the edition by Ḥussam Aḥmad Muḥtār al-'Abbādī (2007); for the textual variants occurring in the witnesses, refer to it (pp. 21-29, 37-38). For comments to the text and its Italian translation, see Fani (2012/2013), pp. 136-147, 153-154. N.B. Arabic terms in the English translation are in the singular forms. Here we translate what relates to black writing inks.

مِدَادٌ آخِرٌ لِلرَّازِي:

تَأْخُذُ ثَلَاثِينَ عَفْصَةً فَتَرْضُهَا وَتَصَبُّ عَلَيْهَا ثَلَاثَةَ
أَرْطَالٍ مَاءٍ وَتَطْبُخُهُ بِنَارٍ لَيِّنَةٍ حَتَّى يَذْهَبَ النِّصْفُ ثُمَّ
يُصَفَّى وَيُطْرَحُ فِيهِ زَاجٌ جَيِّدٌ وَزَنْ خَمْسَةَ دِرَاهِمٍ
وَصَمْغٌ عَرَبِيٌّ وَزَنْ سَبْعَةَ دِرَاهِمٍ وَيُوضَعُ فِي الشَّمْسِ
يَوْمًا وَيُكْتَبُ بِهِ، وَإِنْ لَمْ يَكُنْ سَوَادَهُ جَيِّدًا وَكَانَ إِلَى
الْحُمْرَةِ زِدْتُمْ فِيهِ زَاجًا وَإِنْ لَمْ يَكُنْ بَرِيقًا فَزِدْتُمْ فِيهِ
صَمْغًا قَلْتُمْ فَلَا عِبْرَةَ إِذَا بَمَا قَالَ مِنْ وَزَنِ الزَّاجِ
وَالصَّمْغِ وَإِنَّمَا يُجْعَلُ فِيهِ بِحَسَبِ مَا يُرَادُ مِنَ السَّوَادِ
وَالْبَرِيقِ.

Another *midād* by al-Rāzī²:

Take thirty gallnuts, grind them, pour three *ratl* [1191.78 mL] of water over them and cook on low heat until half is evaporated; then clarify it and add five *dirham* [15.45 g] of weight of good vitriol and seven *dirham* [21.63 g] of gum arabic; put it in the sun for a couple of days and then write with it. If it is not black enough and tends to red, add to it some vitriol, while if it is not bright enough, add some gum. What matters in what I said about the weight of the vitriol and the gum is that it is established according to which grade of black and brilliance you want to obtain.

[Q I.5]

مِدَادٌ آخِرٌ لِحْتِشُوعِ ذِكْرِهِ الرَّازِي:

تَأْخُذُ مِنَ الْعَفْصِ الْمَدْقُوقِ مَكْيَالًا وَثَمَانِيَةَ مَكْيَالِ مَاءٍ
ثُمَّ أَطْبُخُهُ فِي طَنْجِيرٍ حَتَّى يَذْهَبَ الرَّبْعُ ثُمَّ يُبْرَدُ
وَيُصَفَّى بِخَرْقَةٍ صَفِيْفَةٍ وَيُلْقَى عَلَيْهِ مِنْ زَاجٍ وَقَلْبِهِ مَا
يَكْفِيهِ وَكَذَلِكَ مِنَ الصَّمْغِ.

Another *midād* mentioned by al-Rāzī:

Take one *mikyāl* [4.41 g] of ground gallnuts and eight [35.31 ml] of water. Cook them in a pot until a quarter of it evaporates; then let it cool and filter the mixture with a piece of cloth and add some vitriol; once stirred enough, do the same thing with the gum.

[Q IB] *Extracted using a piece of cloth containing the galls like tea is prepared (squeezed)*

مِدَادٌ مَعْصُورٌ:

يُؤْخَذُ مِنَ الْعَفْصِ الْمُضْرَسِ الْأَسْوَدِ السَّالِمِ مِنَ الثَّقَبِ
ثَلَاثَ أَوْاقٍ وَيَدْقُ فِي هَاوِنٍ دَقًّا نَاعِمًا حَتَّى يَعُودَ
كَالْكُحْلِ ثُمَّ يَوْضَعُ فِي خَرْقَةٍ حَرِيرٍ وَيَوْضَعُ عَلَيْهِ مِنَ
الْمَاءِ الشَّدِيدِ السَّخَانَةِ مَقْدَارُ نِصْفِ رَطْلٍ، ثُمَّ يَتْرَكُ فِي
خَرْقَتِهِ حَتَّى يَتِمَّكَنَ مِنْهُ الْمَاءُ وَيَحْكُ بِالْيَدِ حَكًّا بَلِيغًا،
وَيُضَافُ إِلَيْهِ مِنْ مَاءِ الزَّاجِ قَدْرُ الْكِفَايَةِ وَيُقَطَّرُ كَمَا
يُقَطَّرُ الْعَكْرُ وَيُؤْخَذُ مَا قَطَرَ مِنْهُ وَيَسْتَعْمَلُ.

Midād obtained by squeezing:

Take three *ūqiyya* [99.32 g] of very tannic and black gallnuts without holes on the surface and grind them finely in a mortar until they become like antimony powder; then put the powder into a piece of silk and pour over it very hot water in the amount of half a *ratl* [198.63 mL]; leave the mixture to rest closed in the piece of fabric³ until the water is soaked; then rub it vigorously with the hand and add on it a sufficient quantity of dissolved vitriol. Let it fall in drops as it is done with sediment of tea. Take what drips from the bundle and use it.

² Abū Bakr Muḥammad b. Zakariyya' al-Rāzī (m. 925), the famous physician and alchemist who also authored a treatise on ink making.

³ The piece of cloth / fabric is possibly thin and tightly weaved; like silk.

[Q 1.7]

مَدَادٍ آخَرَ:

تَأْخُذُ أُوقِيَّتَيْنِ مِنْ عَفْصٍ وَتَدْقُهُمَا دَقًّا بَلِيغًا وَتَصْرُهُمَا فِي خِرْقَةٍ صَفِيْقَةٍ وَتَصُبُّ عَلَيْهِمَا نِصْفَ رَطْلٍ مَاءِ وَرَقِّ الرَّيْحَانِ الْمَطْبُوحِ وَهُوَ فِي غَايَةِ مِنَ السَّخَانَةِ وَتَهْرَسُهُمَا بِالْيَدِ هَرَسًا بَلِيغًا وَتُضَيِّفُ إِلَى الْجَمِيعِ مِنَ الزَّاجِ وَالصَّمْغِ بِقَدْرِ مَا يَرْضَى مِنْ لَوْنِهِ وَبَرِيْقِهِ ثُمَّ يَقْطُرُ كَمَا يَقْطُرُ الْعَكْرُ وَيَسْتَعْمَلُ صَفْوَهُ وَيَسْقَى أَبَدًا بِمَاءِ الصَّمْغِ الْعَرَبِيِّ وَإِنْ أَرَدْتَهُ كَثِيرَ الْحُمْرَةِ قَلَّ الزَّاجُ وَإِنْ تَشَاءُ فَالْقُ فِيهِ مِنْ عُصَارَةِ حَبِّ الرُّمَّانِ بِقَدْرِ مَا يَرْضِيكَ لَوْنُهُ وَإِنْ تَشَاءُ فَاجْعَلْ فِيهِ مِنْ عُصَارَةِ قَشْرِ الْجَوْزِ الْأَخْضَرِ بِحَسَبِ مَا تَرِيدُ فَإِنَّ ذَلِكَ يَزِيدُ مِنْ لَوْنِهِ وَيَحْسِنُهُ وَإِنْ تَشَاءُ فَاجْمَعْ بَيْنَ عُصَارَةِ الْجَوْزِ وَعُصَارَةِ حَبِّ الرُّمَّانِ وَخُذْ مِنْ صَفْوَهُمَا قَدْرَ الْحَاجَةِ.

Another *midād*:

Take two *ūqiyya* [66.21 g] of gallnuts and grind them finely; wrap them in a piece of cloth tight in weft and pour over them half a *ratl* [198.63 mL] of decoction of myrtle leaves still very hot and mash it well with the hand; then add the vitriol and gum in such quantities that you are satisfied with the colour and brilliance, and finally let the mixture drip as you do with a sediment of tea, and use the part that flows. Dampen always the preparation with dissolved gum arabic. If you want the ink to be more reddish, decrease the vitriol. If you want, add pomegranate seed juice to the mixture until its colour satisfies you, or add some juice obtained from the green peel of the walnut in the measure you want as this will intensify and improve its colour; or, if you want, combine the juice [of the walnut peel] and that of pomegranate seeds and take the quantity you need of their filtered juice.

[Q IC] *Extracted at room temperature (infusion)*

[Q 1.8]

مَدَادٍ مَنْقُوعٍ:

تَأْخُذُ مِنَ الزَّاجِ الْأَخْضَرِ مِثْلًا وَتَجْعَلُ عَلَيْهِ خَمْسَةَ أَمْثَالِهِ مَاءً فِي إِنَاءٍ لَمْ يُمْسَهُ دَسَمٌ وَمِنَ الْعَفْصِ الْأَخْضَرِ الْمَضْرَسِ السَّالِمِ مِنَ الثَّقَبِ وَتَرْضُهُ وَتَجْعَلُهُ فِي إِنَاءٍ عَلَى جِدَّةٍ مَعَ خَمْسَةِ أَمْثَالِهِ مَاءً وَمِنَ الصَّمْغِ الْعَرَبِيِّ الْمُنْقَى مِنَ التُّرَابِ قَدْرَ الْجَمِيعِ وَتَجْعَلُ عَلَيْهِ مِنَ الْمَاءِ قَدْرَ جَمِيعِ الْمَاءِ أَيْضًا فِي إِنَاءٍ عَلَى جِدَّةٍ وَيَتْرَكَ فِي زَمَانِ الْبَرْدِ أَرْبَعَةَ أَيَّامٍ وَفِي زَمَانِ الْحَرِّ يَوْمَيْنِ وَيُضْرَسُ الْعَفْصُ فِي مَانِهِ ضَرْسًا جَيِّدًا وَيُصْفَى مِنَ خِرْقَةٍ صَفِيْقَةٍ فِي إِنَاءٍ لَمْ يُمْسَهُ دَسَمٌ ثُمَّ يُصْفَى الزَّاجُ عَلَيْهِ لَكِنْ بِرِفْقٍ (لِنَلَا) يَتَعَكَّرُ مَأْوُهُ وَيَسْرِي فِيهِ التُّرَابُ ثُمَّ يُصْفَى الصَّمْغُ عَلَى الْجَمِيعِ، وَتَأْخُذُ جَمِيعَ الصَّفْوِ وَتَتْرَكُهُ يَوْمَيْنِ ثُمَّ تَنْقَلُهُ بِرِفْقٍ لِلْبَيْسِ وَخُذْ مَا تَعْقَدُ وَأَضِفْهُ لِلتَّقْلِ كُلِّهِ بَعْدَ جَمْعِهِ فِي إِنَاءِ الصَّمْغِ وَاجْعَلْ عَلَى الْجَمِيعِ مَا يَغْمَرُهُ مِنَ الْمَاءِ وَصَبْ مِنْهُ مَدَادًا ثَانِيًا وَارْمِ بِالتَّقْلِ فَهَذَا مَدَادٌ حَسَنٌ يَصْلُحُ لِأَنْ يَكْتُبَ فِي الْكَاعْدِ وَالرَّقِّ وَيَجِيءُ أَسْوَدَ بَرَّاقًا.

Midād obtained by maceration:

Take one part of green vitriol and add five parts of water to it in a vase not soiled with grease. Take some green and sour gallnuts, without holes: grind them and put them in a separate vase with five parts of water. Take [also] some gum arabic clean of dust in an amount equal to the total [of the other ingredients] in a separate vase and add water to it in an amount equal to the total of the water [used with the other ingredients]. Leave it to rest for four days during the cold season and for two days during the warm season and gallnuts will abundantly transfer their tanning agent to the water. Then filter it with a piece of cloth tight in weft in a vase without traces of grease. At this point pour also the [solution of] vitriol inside, but gently, so that the liquid does not become turbid and the powder does not spread inside; finally add also the [melted] gum to the mixture. Then take it all and leave it to rest for two days. Move it gently into the pitcher, take the coagulated part and filter all the sediment. Put it in the vase that contained the gum and add enough water. By filtering this mixture another ink will come out which swells with the sediment [of the first]. This is a good and effective ink, since it writes on paper and parchment and is a brilliant black.

[Q I.9] *Extracted at room temperature and boiled (infusion & cooked)*

مِدَادٍ آخَرَ مَطْبُوحٍ:

يُؤْخَذُ أُوقِيَّةٌ وَرُبْعٌ مِنَ الْعُقْصِ وَتَدْقُهَا دَقًّا جَيِّدًا فِي الْمِهْرَاسِ وَتُصَبُّ عَلَيْهَا رَطْلًا مِنَ الْمَاءِ الْعَذْبِ وَيُتْرَكُ يَوْمًا وَلَيْلَةً ثُمَّ تَأْخُذُ أُوقِيَّةً مِنَ الصَّمْغِ وَيُهَشَّمُ فِي الْمِهْرَاسِ وَيُصَبُّ عَلَيْهِ مَاءُ الْعُقْصِ الْمَذْكُورِ مَا يَغْمُرُهَا وَيُتْرَكُ يَوْمًا وَلَيْلَةً ثُمَّ يُؤْخَذُ نِصْفُ أُوقِيَّةٍ مِنَ الرَّاحِ وَيُلْقَى عَلَيْهَا مِنَ الْمَاءِ مَا يَغْمُرُهَا وَيُتْرَكُ يَوْمًا وَلَيْلَةً حَتَّى يَحْمَرَّ الْمَاءُ ثُمَّ يُطَبِّخُ الْعُقْصُ عَلَى نَارِ لَيْتَةٍ حَتَّى يَنْقُصَ الثَّلَاثُ ثُمَّ تُصَفَّى فِي خِرْقَةٍ وَتُصَبُّ الصَّمْغُ عَلَى الصَّفْوِ فِي إِنَاءٍ نَظِيفٍ وَتُحَرِّكُهُ وَتُصَبُّ عَلَى الْجَمِيعِ مَا يُرْضِي لَوْنِهِ.

Another *midād* obtained by decoction:

Take one and a quarter *ūqiyya* [41.38 g] of gallnuts and grind them finely in a mortar; pour into it one *ratl* [397.26 mL] of fresh water and leave it to rest for one day and one night. Then take one *ūqiyya* [33.105 g] of vitriol, crumble it in a mortar and pour over it the macerated gallnuts already mentioned, enough to cover it, and leave it to rest for one day and one night until the water turns red. At this point cook the gallnuts on a low heat until one third is evaporated, pour them into a piece of cloth, pour the [melted] gum over the filtered liquid in a clean container and stir; add whatever you like to the mixture so that its hue satisfies you.

[Q I.10] *Different source of phenols*

مِدَادٍ آخَرَ:

تَأْخُذُ مِنَ الْجُودِرِ جِزْءًا أَوْ مِنْ قَشْرِ الشَّوْبِرِ النَّبِيءِ الَّذِي يُدْبَعُ بِهِ جِزْءًا وَتَجْعَلُهُمَا فِي إِنَاءٍ لَمْ يَمْسُهُ دَسَمٌ بَعْدَ وَضْعِهِمَا مَعَ مَا يَغْمُرُهُمَا مِنَ الْمَاءِ وَاتْرَكَهُمَا فِي زَمَانِ الْبَرْدِ عَشْرَةَ أَيَّامٍ وَفِي زَمَانِ الْحَرِّ خَمْسَةَ أَيَّامٍ وَاجْعَلُهُمَا فِي كُلِّ يَوْمٍ لِلشَّمْسِ وَاهْرَسُهُمَا فِي كُلِّ يَوْمٍ هَرَسًا بَلِيغًا وَإِذَا كَانَا مَدْقُوقَيْنِ كَانَ أَسْرَعَ لَخُرُوجِ فَذَاتِهِمَا فَإِذَا رَأَيْتَ الْمَاءَ قَدْ انْصَبَعَ صَبْغًا جَيِّدًا بِحَيْثُ يُمَكِّنُكَ الْكَتَبُ بِهِ فَطَرَّهُ وَأَضْفَ لَدَيْكَ الْمَاءَ شَيْئًا مِنْ حَبِّ الرُّمَّانِ وَمَاءِ الصَّمْغِ وَاتْرَكُهُ فِي إِنَاءٍ يَنْعَقِدُ يَوْمًا ثُمَّ انْقَلَبَ بِرَفْقٍ وَخُذْ مَا تَعُوزُ وَاجْعَلْهُ عَلَى التَّنْفَلِ وَرُدِّ عَلَيْهِ مَاءً وَافْعَلْ كَمَا فَعَلْتِ وَاعْمَلْ مِنْهُ مِدَادًا ثَانِيًا إِنْ أَرَدْتِ وَهَذَا الْمِدَادُ يَجِيءُ أَحْمَرَ بَرَّاقًا وَقَدْ يُصْنَعُ هَذَا الْمِدَادُ مِنَ الْمَاءِ الَّذِي يَكُونُ فِي النَّفْرَاتِيَّةِ وَهِيَ تَكُونُ فِي أَجْسَادِ الشَّوْبِرِ وَيُوجَدُ مَعْقُودًا وَسَائِلًا فَمَتَى وَجِدَ سَائِلًا يَضَافُ إِلَيْهِ شَيْءٌ مِنْ غُصَارَةِ قَشْرِ الْجُوزِ الْأَخْضَرِ وَشَيْءٌ مِنْ مَاءِ الرُّمَّانِ وَشَيْءٌ مِنْ مَاءِ الصَّمْغِ وَيُتْرَكُ حَتَّى يَطْيَبَ وَيُصَفَّى وَيُسْتَعْمَلُ وَبِهَذَا الْمِدَادِ تَنْسَخُ الْمَصَاحِفُ فِي الْأَنْدَلُسِ وَقَدْ جَلَبْتُهُ أَنَا غَيْرَ مَرَّةٍ وَكَتَبْتُ بِهِ وَلَمْ أَعْمَلْ فِيهِ غَيْرَ مَا ذَكَرْتُ وَاسْتَعْمَلْتُهُ فَجَاءَ حَسَنًا بَرَّاقًا.

Another *midād* :

Take one part of *darnel* or one part of the bark of a cork oak, the one that is used to dye, and put it in a container not soiled with grease; then cover it with water and leave it to rest during the cold season for ten days, during the warm season for five days; keep it in the sun all the day and mash it finely throughout the day: the extraction of their properties will be faster if they are pulverized. When you see that the water is dyed enough to be used for writing, hone the mixture and add some pomegranate seeds and melted gum arabic and leave it to thicken in a vase for two days. Then transfer the mixture gently, taking as much as you need of it, and put it on the sediment. Add more water [to this sediment] and do the same thing, so that you can get another ink if you wish. This ink will be bright red and is produced with a liquid that is in the lymphatic vessels placed along the trunks of the cork oak. The lymph can be solid or liquid: if it is liquid, add a little of juice of green walnut peels, a little of pomegranate juice and a little of melted gum arabic; leave it to rest until the mixture is ready and [its liquid part] is clarified and use it. The codices of the Qur'an are copied with this ink in Andalusia, and I have produced it more than once and I have written with it. To produce it, do not use anything else than what I have mentioned. I used it and it turned out to be beautiful and shiny.

[Q I.11]

مِدَادٍ لِسَاعَتِهِ لِلرَّازِي:

تَأْخُذُ مِنَ الْعُقْصِ مَا شِئْتَ فَتَدْقُهُ نَاعِمًا مِثْلَ الْكُحْلِ ثُمَّ تُصَبُّ عَلَيْهِ مَاءٌ ثُمَّ تَسْحَقُهُ فِي الْهَائُونَ بِالْمَاءِ سَحْقًا جَيِّدًا حَتَّى يَزْبَدَ ثُمَّ تُصَفَّى بِخِرْقَةٍ صَفِيْفَةٍ ثُمَّ صَيَّرَهُ فِي إِنَاءٍ آخَرَ وَأَلْقَى عَلَيْهِ مِنَ الْقَلَنْقَتِ الْمَسْحُوقِ مَا يَكْفِيهِ

Instantaneous *midād* by al-Rāzī:

Take the desired quantity of gallnuts and grind them as fine as the powder of antimony. Pour water over it and grind vigorously in a mortar until it forms a foam; then filter the mixture in a piece of cloth (tight in weft and thin) into another container and add enough crushed *qalqant* to it: you will see that

وترى أنه قد اسودَّ ثُمَّ اطْرَحْ عَلَيْهِ مِنَ الصَّمغِ الْعَرَبِيِّ
واكتب به لِسَاعَتِهِ.

the mixture will turn black. Then add some gum arabic and write instantly.

[Q I.12] Mixed ink prepared as dry hazelnut-sized spheres (*pellets*)

[Q I.12]

مِدَادٌ آخَرُ:

تَأْخُذْ مِنْ مِدَادِ الشُّوبَرِ الْمَعْفُودِ أَجْوَدَ مَا يَكُونُ جُزْءًا أَوْ
مِنْ صَمغِ عَرَبِيِّ جُزْءًا أَوْ مِنْ عَفْصِ جَزْنِينَ وَمِنْ
رَمَادِ الْقَرَاتِيْسِ الْمَحْرُوقَةِ نِصْفَ جُزْءٍ يُجْمَعُ ذَلِكَ
وَيُدَقُّ وَيُنْحَلُّ ثُمَّ يُسْحَقُ بَبِيضِ الْبَيْضِ نَاعِمًا وَتَعْمَلُ
مِنْهُ شَبَهَ الْبِنَادِقِ ثُمَّ تَجْعَلُهُ فِي الدَّوَاةِ وَتَكْتُبُ بِهِ فِي
الْقَرطَاسِ فَإِنَّهُ مِدَادٌ فَائِقٌ شَدِيدُ الْإِحْتَوَاءِ.

Another *midād*:

Take one part of thickened ink of cork oak, the best one, one part of gum arabic, two parts of gallnuts and half part of pulverized papyrus ash; combine everything, pulverize it and sieve it, then grind it well with egg white and make pellets similar to hazelnuts. Put this ink in the inkpot and write on the papyrus: it is truly an excellent and very stable ink.

[Q I.13]

مِدَادٌ:

يُؤْخَذُ مِنْ دُخَانِ خَشَبِ الصَّنُوبَرِ الْخُرِّ عَشْرَةَ دَرَاهِمَ
وَمِنْ الصَّمغِ الْعَرَبِيِّ سَبْعَةَ دَرَاهِمَ وَيُسْحَقُ الصَّمغُ
جَيِّدًا وَيُنْفَعُ فِي أَوْقِيَّةٍ مِنْ مَاءِ السَّمَّاقِ حَتَّى يَنْحَلَّ ثُمَّ
يُجْعَلُ الدُّخَانُ فِي الْهَآوِنِ وَيُفَطَّرُ عَلَيْهِ قَلِيلًا قَلِيلًا
وَيُرَبَا يَرْفَعُ.

Midād:

Take ten *dirham* [30,09 g] of soot obtained from a genuine pine wood and seven of gum arabic; grind finely the gum arabic and immerse it in one *ūqiyya* [33.105 g] of sumac water until it is dissolved. Place the soot inside the mortar and drip over it little by little [the melted gum]: [this] will swell and [the mixture] will augment.

[Q I.14]

أَحْسَنُ دُخَانٍ يُعْمَلُ الْمِدَادُ مِنْهُ:

تَأْخُذُ قَنْدِيلًا جَدِيدًا وَتَعْمَلُ فِيهِ فَنِيْلًا بِشَيْءٍ مِنَ الرِّبْتِ
الْمَسْبُوكِ ثُمَّ رَكَّبْ عَلَى السِّرَاجِ إِنَاءً جَدِيدًا مِنْ فَخَّارٍ
وَشَكْلُهُ كَشَكْلِ التَّنُورِ وَأَعْلَاهُ مُسْتَدِيرٌ ضَيْقٌ وَفِي أَعْلَاهُ
ثَقْبٌ فَأَوْقِدْ فِي التَّنُورِ وَدَعِ السِّرَاجَ يَنْقَدُ وَإِذَا فَنِيَ
الزَّيْتُ الَّذِي فِيهِ زِدْتَ فِيهِ زَيْتًا آخَرَ وَلَا تَزَالُ تَجْعَلُ
ذَلِكَ حَتَّى يَجْتَمِعَ مِنْ ذَلِكَ الدُّخَانُ مَا يَكْفِي وَأَكْثَرُ مَا
يَسْرِفُ الْمِدَادُ الَّذِي يَصْنَعُ مِنْ هَذَا فِي التَّكْحِيلِ وَأَشَدُّ
النَّاسِ حَاجَةً إِلَيْهِ الْمَذْهَبُونَ فَاعْلَمْهُ، وَرَبَّمَا عَمَلْتَ
فَتَائِلَ مِنْ قَطْنِ طَيِّبٍ وَدَهْنَتَهُ بِالزَّيْتِ وَيَوْقِدُ فِي إِنَاءٍ
حُتْمَ حَتَّى يَحْتَرِقَ وَيُؤْخَذُ مَا تَعْلَقُ بِالشَّقْفِ مِنْ دُخَانِهَا
وَيُحَلُّ بِالْحَلِّ وَيُجْعَلُ فِي إِنَاءٍ رِصَاصٍ وَيُكْحَلُ بِهِ.

The best soot to prepare the *midād*:

Take a new lamp and place a wick inside it with a little poured oil; then mount on the light a new terracotta container, shaped like an oven, with the round and narrow top that has a hole at the top. Light the fire in the oven and put the lighted lamp inside it; when the oil inside the latter is consumed, add more in it and continue like this until enough soot has accumulated. Most of what is left of the ink produced with this soot is used to trace the black outlines, and people who decorate with gold need it very much, know it. Sometimes wicks are prepared with cotton of good quality and are soaked in the oil; they are burned in a sealed container until they are completely burned and then the soot that remains attached to the shards is taken and dissolved with vinegar; it is placed in a container made of lead, and the black outlines [of scripts and drawings] are traced with this.

[Q I.15]

صنعة مِداد:

يُخَلَطُ مِنَ الْعَفْصِ وَالصَّمْغِ جُزْءَانِ عَلَى السَّوَاءِ وَيُسْحَقَانِ حَتَّى يَصِيرَا فِي قَوَامِ الْكُخْلِ وَيُضَافُ إِلَيْهِمَا نِصْفُ جُزْءٍ مِنَ الرَّاجِ الْأَخْضَرِ وَيُسْحَقُ الْجَمِيعُ سَخْفًا نَاعِمًا وَيُجْمَعُ بَيَاضُ الْبَيْضِ حَتَّى يَصِيرَ مِثْلَ الْعَجِينِ وَيُبْنَدَقُ وَيَجْفَفُ فِي الظِّلِّ فَمَتَى احْتَبَجَ لشيءٍ مِنْهُ حُكٌ فِي الْمَاءِ وَاسْتَعْمِلَ.

Preparation of a *midād*:

Take two equal parts of gallnuts and gum and grind them until in their consistency they become like antimony powder; add half a part of green vitriol and grind everything finely; add egg white until the mixture becomes like bread dough, and form small hazelnut-sized spheres that are left to dry in the shadow. When you need a little of this ink, rub it in water and use it.

[Q I.16] *Extracted under the sun (infusion & evaporation) for hazelnut-sized spheres (pellets)*

مِدادٌ آخَرُ:

تَأْخُذُ مِنْ جَرِيْشِ الْعَفْصِ مَا أَحْبَبْتَ وَتَنْقَعُهُ وَتَأْخُذُ مَاءَهُ بَعْدَمَا يَسْتَوِي فِي نَقْعِهِ وَتَضَعُهُ فِي إِنَاءٍ لِلشَّمْسِ حَتَّى يَنْعَقَدَ وَيَصِيرَ جَافًا ثُمَّ تُسْحَقُهُ مَعَ مِثْلِهِ مِنَ الصَّمْغِ الْعَرَبِيِّ الْمُتَقَى مِنَ التَّرَابِ وَالْحَشْبِ وَتَنْقَعُ مِنَ الرَّاجِ قَدْرَ نِصْفِ أَجْزَائِهِمَا فِي خَمْسَةِ أَمْثَالِهِ مَاءً وَتَتْرُكُهُ حَتَّى يَنْزِلَ وَتَأْخُذُ مَاءَهُ وَتَضِيفُ إِلَيْهِ شَيْئًا مِنْ بَيَاضِ الْبَيْضِ وَيُحَكُّ بِذَلِكَ الْعُبَارِ حَتَّى يَصِيرَ الْجَمِيعُ جُزْءًا وَاحِدًا وَتَبْنَدِقُهُ وَتَجْفَفُهُ لِلظِّلِّ فَإِذَا أَرَدْتَ اسْتِعْمَالَهُ خَلَلْتَهُ بِقَلِيلِ مَاءٍ وَكَتَبْتَ بِهِ.

Another *midād*:

Take the chopped gallnuts as much as you want and macerate them; take the liquid part when the maceration occurs and put it in a container under the sun until it is thickened and dried. Then grind it with the same quantity of gum arabic not contaminated by dust or wood [particles]. Then immerse some vitriol, [in an amount] equal to their half, in water, equal to five times of the amount of vitriol, and leave it to rest until it is settled. Then take the liquid part and add some egg white; rub it with that powder until everything become of a homogeneous consistency and form spheres as big as hazelnuts that are left to dry in the shadow. When you want to use, dissolve them in a little water and write.

[Q IE] Other inks

[Q I.17] *Extraction by boiling (cooked), add redwood extracts*

مِدادٌ آخَرُ:

تَأْخُذُ مِنْ صَفْوِ أَحَدِ الْأَمِدَّةِ الْمَطْبُوحَةِ أَرْبَعَةَ أَجْزَاءٍ وَمِنْ مَاءِ الْبَقْمِ⁴ الْمَطْبُوحِ جُزْءًا وَزِدْ فِيهِ يَسِيرَ صَمْغٍ فَإِنَّهُ يَجِيءُ أَحْمَرَ بَرَّاقًا صَافِيًا.

Another *midād*:

Take four parts of clear liquid of one of the inks obtained by decoction and one part of sappanwood decoction; add some gum and it will become bright and stable red.

[Q I.18]

مِدادٌ لَا يَنْقَلِعُ أَبَدًا وَهُوَ أَيْضًا خِصَابٌ ذَكَرَهُ الرَّازِي مِنْ شَقَائِقِ النُّعْمَانِ:

تَأْخُذُ مَا أَحْبَبْتَ وَتَحْشَوْهُ فِي قَارُورَةٍ رَقِيْقَةٍ ثُمَّ تَدْفِنُهُ فِي السَّرْفِينِ وَتَبْدُلُ السَّرْفِينِ كُلَّ ثَلَاثَةِ أَيَّامٍ حَتَّى تَنْظُرَ إِلَيْهِ وَقَدْ ذَابَ وَصَارَ مَاءً ثُمَّ اكْتُبْ بِهِ حَيْثُ شِئْتَ فَإِنَّهُ لَا يَمْحَى وَإِنْ دَفَعْتَ فِي الْمَاءِ أَيَّامًا وَإِنْ شِئْتَ أَنْ يَكُونَ بَرَّاقًا فَاجْعَلْ فِيهِ صَمْغًا فَإِنَّهُ عَجِيبٌ.

A *midād* that never fades and that is also a dye mentioned by al-Rāzī, made with red anemones:

Take the quantity you want and insert it in a thin bottle; then dig it in manure that you will replace every three days, until the content is dissolved and you will see that it has become liquid. Then write with it where you want, and it will not be deleted even if you put it in the water for days. If you want to make it brighter, add some gum and it will be wonderful.

⁴ In al-'Abbādī's edition vocalized as *baqqim*, but read *baqqam*.

[Q I.19] *Extraction by boiling (cooked), add redwood extracts*

مِدَادِ البَقْمِ:

الذي يصرف في الأمدّة ... بقم ثلاثة أجزاء وشبّ جزء يطبخ حتى تخرج قواه ويرضى حاله ويلقى الصمغ على صفوه ويستعمل.

Midād of Sappanwood:

That is used for the ink [...] three parts of sappanwood and one part of vitriol, cooked until their properties are released and their consistency is satisfying; add gum to the filtered part and use it.

[Q I.20] *Squeezed*

مِدَادِ العَلَامَةِ:

وهو المِدَاد الذي يكتب به السلاطين العَلَامَة. لم يستحسن ابن أبي الخصال الكُتْبَ بغيره من الأمدّة وقال في وصفه: المُستحسن أن يكون أسودَ بَرًاقا تغلوه حُمْرَة حَسَنَ البَصِيصِ قَلِيلَ التَّعْقِيدِ فَإِنَّهُ يَنْشِطُ لِلْكَتْبِ يَعْملُ إرسال اليد ويساعد على سُرْعَة القلم وصفته أن يُؤخَذَ مِنَ العَفْصِ الطَّيِّبِ الأَسْوَدِ المُضَرَّسِ السَّالِمِ الثَّقِيلِ الحَجْمِ ثلاثِ أواقٍ أو ما أَحَبَّ الصَّانِعِ وَيُدقُّ فِي هَاوَنٍ نُحَاسٍ دَقًّا نَاعِمًا حَتَّى يَعودَ فِي قِوَامِ الكُحْلِ ثُمَّ يُوضَعُ عَلَيْهِ مِنَ المَاءِ الشَّدِيدِ الدَّفءِ بِمِقْدَارِ نِصْفِ رطلٍ إِنْ كَانَ العَفْصُ ثلاثِ أواقٍ ثُمَّ يَدْخُلُ فِي اليَدِ وَيُعْرَكُ وَهُوَ فِي خِرْقَةٍ صَفِيْقَةٍ حَتَّى يَرْجِعَ قِوَامُ الرُّبِّ الصَّفِيْقِ ثُمَّ تُعَصَّرُ الخِرْقَةُ وَتُرَالُ وَيُؤخَذُ مِنَ الرَّاجِ الطَّيِّبِ الأَخْضَرِ المُزْنَجِرِ الذي يُسَمَّى القَلْقَطَارِ وَيُوضَعُ مِنْهُ فِيهِ بِمِقْدَارِ الإِرَادَةِ ثُمَّ يُؤخَذُ مِقْدَارُ دِرْهَمَيْنِ مِنَ السُّكَّرِ السُّلَيْمَانِيِّ وَيُضَافُ لَهُ وَيُنْرَكُ لَيْلَةً ثُمَّ يُصَفَّى فَإِنْ كَانَ فِي زَمَنِ الشَّتَاءِ وَضِعَ فِي بَنِيْسٍ وَرُفِعَ، وَإِنْ كَانَ فِي زَمَنِ الصَّيْفِ لَمْ يَضُرَّهُ أَنْ يَبْقَى مَرُوحًا وَيَكْتَبَ بِهِ لِلْحَيْنِ.

Midād for the 'alāma:

This is the ink with which the sultans write their 'alāma. Ibn Abī al-Ḥiṣāl⁵ does not approve the writing if it is not done with this one among the inks and he says in his description: "The best thing is when it is bright black with a hint of red, of a beautiful shimmer and of little thickness; it really revives the writing, directs the hand and helps the flowing of the *qalam*. The method to produce it consists in taking three *ūqiyya* [99.32 g] of good gallnuts, black, tannic, intact and light, or the quantity the craftsman likes; finely grind them in a fine copper mortar until they get the consistency of antimony powder; pour over it very hot water in the amount of half a *ratl* [198.63 mL] if the gallnuts are three *ūqiyya* [99.32 g], and put the mixture in one hand, rubbing it inside a piece of cloth tight in weft, until it gets the consistency of thick marmalade. Then squeeze the cloth and drip the juice; take good oxidized⁶ green vitriol called *qulquṭār* and add the desired amount of it to the mixture. Then take two *dirham* [6.18 grams] of Sulaymān sugar and add it to the rest. Leave the mixture to rest overnight and then filter the solution; during the winter put it in a jug and leave it aside, while during the summer it will not be damaged if remained exposed to the air and you can write with it when necessary.

[Q I.21] *Extraction by boiling until a certain amount of water is evaporated (cooked)*

مِدَادِ آخَرَ:

تَأخُذُ مِنَ العَفْصِ الذي يَكُونُ عَلَى الصِّفَةِ المُتَقَدِّمَةِ الدَّكْرِ مَا شِئْتَ وَتَدُقُّهُ حَتَّى يَصِيرَ أَمْثَالَ الحِمَصِ ثُمَّ تَنْقَعُهُ فِي مَاءٍ شَدِيدِ الحَرَارَةِ يَوْمًا وَلَيْلَةً ثُمَّ تَطْبُخُهُ حَتَّى تَرَى مَاءَهُ فِي الحَدِّ الذي تَرِيدُ مِنَ الرِّقَّةِ أَي الحِثَارَةِ ثُمَّ تُصَفِّيه وَتَلْقِي فِي صَفْوِهِ نِصْفَ دِرْهَمٍ مِنَ الصَّمغِ العَرَبِيِّ مَسْحُوقًا وَنِصْفَ دِرْهَمٍ مِنَ السُّكَّرِ السُّلَيْمَانِيِّ وَتَضِيفُ لَهُ مِنَ الرَّاجِ مِقْدَارَ مَا يَرْضَى وَتَرْفَعُهُ فِي إِنَاءٍ فَإِذَا أَرَدْتَ الكُتْبَ بِهِ زِدْتِ فِي الدَّوَاةِ شَيْئًا مِنَ السُّكَّرِ قَلْتِ جِدْتَهُ، فِي هَذَا المِدَادِ

Another midād:

Take the desired amount of gallnuts that have the appearance described above and grind them until they become as chickpeas; therefore soak them in very hot water for one day and one night and then cook them until the liquid will get the desired degree of fineness or thickness. At this point drain it and add to the clear part half a *dirham* [1.54 g] of pulverized gum arabic, half a *dirham* [1.54 g] of Sulaymān sugar, and the desired amount of vitriol, and place [this mixture] in a container. When you want to write, add a small amount of sugar in the inkpot to decrease its bitterness. In this ink there is half a *dirham* [1.54 g] of gum arabic, while for

⁵ He was a *kātib* (secretary or chancellor) at the court of Tāshūfīn b. 'Alī b. Yūsuf (r. 1143-1145) the sixth Almoravid Emir.

⁶ *Muzanġar*, from the Persian *zinġār*, that is verdigris or cupric oxide; it also indicates, more generically, "oxide" or "rust".

لِلصَّمغِ نِصْفُ دِرْهَمٍ وَالْعَفْصُ غَيْرُ مَحْدُودِ الْقَدْرِ
وَلَيْسَ بِصَوَابٍ وَإِنَّمَا حَقُّهُ أَنْ يَقُولَ مَا يَحْمِلُ مِنْ غَيْرِ
تَعْيِينَ فَإِنَّ قَلَّةَ الصَّمغِ لَا تُؤَثِّرُ فِيهِ وَكَثْرَتُهُ تَعْقِدُهُ.

gallnuts there is no defined amount: this is not correct, while it is right to say [at least] what is known of what is not established, that is that a [too] little amount of gum does not have any effect while too much solidifies it completely.

[Q IF] Advices and notices

[Q I.22]

تنبيه:

إِذَا أَرَدْتَ أَنْ تَطَيِّبَ رَائِحَةَ الْمِدَادِ فَتَأْخُذْ مِنَ الْكَنْدَرِ
الطَّيِّبِ قَدْرَ نِصْفِ سُدْسِ الْعَفْصِ وَتَدْرُسْ دَرَسًا جَيِّدًا
حَتَّى يَصِيرَ كَالْغُبَارِ وَتَصْرُهُ فِي خِرْقَةٍ وَتَضَعُهَا فِي
صَفْوِ الْمِدَادِ فَإِنَّهُ يُكْسِبُهُ رَائِحَةً عَطِرَةً وَإِذَا أَرَدْتَ أَنْ
لَا يَحْمُرَ لَكَ مِدَادٌ فَاجْعَلْ فِيهِ يَسِيرًا مِنَ الزُّنْجَارِ
مَحْلُولًا بِمَاءِ الصَّمغِ الْعَرَبِيِّ أَوْ حُلَّهُ فِي يَسِيرٍ مِنَ
الْمِدَادِ ثُمَّ اخْلُطْهُ مَعَ الصَّفْوِ وَإِنْ أَرَدْتَ أَنْ لَا يَنْعَقِدَ
فَاجْعَلْ فِيهِ يَسِيرًا مِنْ سُكَّرِ طَبْرُزْدٍ وَإِنْ أَرَدْتَ أَنْ لَا
يَخْتَرِقَ الْكَاعِدَ بِالْمِدَادِ أَبَدًا فَقَلِّلِ الزَّرَّاجَ وَكَثِّرِ الصَّمغَ
فِي الْمِدَادِ وَإِنْ أَرَدْتَ أَنْ لَا يَنْزِلَ ذُبَابٌ عَلَى الْمِدَادِ وَلَا
تَأْكُلَ الْأَرْضَةُ مَوْضِعَ الْكُتُبِ مِنْهُ فَضَعْ فِي الْمِدَادِ شَيْئًا
مِنْ شَحْمِ الْحَنْظَلِ وَإِنْ أَرَدْتَ أَنْ لَا يَقْدِرَ كَاتِبٌ أَنْ يَكْتُبَ
بِالْمِدَادِ فَاجْعَلْ لَهُ فِي الدَّوَاةِ التَّمْرَ الْهِنْدِيَّ فَإِنَّهُ لَا يَقْدِرُ
عَلَى الْكُتُبِ بِهِ وَإِنْ أَرَدْتَ أَنْ لَا يَثْبِتَ فِي اللَّوْحِ وَيَمْحَى
سَرِيعًا أَكْثَرَ فِيهِ السُّكَّرَ وَإِنْ أَرَدْتَ أَنْ تَرْفَعَ الْمِدَادَ فَإِنْ
كَانَ زَمَنُ الشِّتَاءِ فَضَعْهُ فِي رِصَاصٍ أَوْ خْتَمٍ وَقَدْ قِيلَ
إِنَّ أَنْيَةَ الرَّصَاصِ تُبَيِّضُ الْمِدَادَ وَوَضَعُهُ فِي الْخْتَمِ
أَحْسَنُ وَإِنْ كَانَ فِي زَمَنِ الْقَيْظِ وَضِعَ فِي إِنَاءٍ زَجَاجٍ.

Notice:

If you intend to improve the smell of the ink, take half a sixth of good incense in respect to gallnuts and reduce it well until it is pulverized, wrap it inside a piece of cloth and soak it in the clarified liquid of the ink: it will take a good scent. If you want to prevent an ink from fermenting, add a pinch of verdigris dissolved in the melted gum arabic or dissolve it in a little of ink and then mix it with the clarified part. If you want to prevent an ink from solidifying, add some crystallized sugar. If you want to avoid the corrosion of paper by ink, decrease the vitriol and increase the dose of gum arabic inside. If you want to prevent the flies from settling on the ink and the woodworm from eating the inked paper, add some colocynth oil to the mixture. If you want the writer not to be able to write with a particular ink, add some tamarind to the inkpot and he will not succeed in writing with it. If you want it not to remain on the surface of the *lawh*⁷ but to be deleted quickly,, add sugar. If you want to keep it during the winter, keep it in lead or sealing wax, but it is said that the lead container turns the ink white, and putting it in the sealing wax is better; while during the summer keep it in a glass container.

⁷ The *lawh* is the wooden board used by children when they learn to write (especially the Qur'an). It has to be washed to allow them to rewrite on it.

فصل:

هذا قانونُ تركيبِ المِدادِ الذي يُصنَعُ مِنَ العَفْصِ
وَالزَّاجِ وَالصَّمْغِ وَهُوَ المَوْصُوفُ فِي هَذَا الجَدْوَلِ
المُبَارَكِ، وَهُوَ فِي تَرْكِيْبِ كُلِّ نَوْعٍ مِنَ المِدادِ،
وَأوزَانِهَا، وَصِفَةَ صَنَعَةِ كُلِّ وَاحِدٍ مِنْهَا وَهُوَ هَذَا:

	المطبوخ	المعصور	المنقوع	غبار
عفص	جزء	جزءان	جزءان	جزء
صمغ	جزء	جزء	نصف جزء	جزء
زاج	ربع جزء	عشر جزء	ربع جزء	نصف جزء
ماء	جزء	جزءان	ثلاثة أجزاء	جزء ونصف

فهذا هو ذِكْرُ تَرْتِيبِهَا وَتَرْكِيْبِهَا، عَلَى هَذِهِ الصِّفَةِ
يُصنَعُ كُلُّ وَاحِدٍ مِنْهَا. وَبَقِيَ أَنْ نَذْكُرَ أَقْوَالَهَا وَأَفْعَلَهَا؛
فأولُ ذَلِكَ أَنْ تَعْلَمَ أَنَّهُ مَتَى زَادَ العَفْصُ عَلَى أَجْزَائِهِ
المَعْلُومَاتِ أَسْرَعَ إِلَى الكِتَابَةِ ذُو [...] لَهُ [...] حَتَّى
[...] اد [...] الصَّمْغِ عَلَى أَجْزَائِهِ المَعْلُومَةِ [...]]
رَقِ الكِتَابِ بَعْضُهُ عَلَى بَعْضٍ حَتَّى اد [...] الزَّاجِ
عَلَى مِقْدَارِهِ أُخْرَقَ وَارْتَفَعَ عَلَى الكِتَابِ مِنْ [...] فِي
كُلِّ [...] عَلَى وَف [...] ا [...] آيَاتٍ لَهُ بِصِيصَا وَ
... الحَمَادِ المِدادِ فِي بَعْضٍ ثُمَّ بَعْدَهُ الصَّمْغُ ثُمَّ بَعْدَهُ
الزَّاجُ فَأَمَّا مَنَفَعَةُ العَفْصِ فَهُوَ لِشِدَّةِ قُوَّتِهِ وَأَمَّا الصَّمْغُ
فَهُوَ لِنِيْرِهِ بِقُوَّتِهِ وَالزَّاجُ لِيقْرَ قُوَّتَهُ حَتَّى يَصِلَ
المَوْضِعَ الَّذِي يَحْتَاجُ فَهَذَا رَتْبَةُ أَفْعَالِهَا وَقُوَّتِهَا.

Chapter:

This is the norm for producing the ink made of
gallnuts, vitriol, and gum, and it is described in this
blessed scheme, which concerns the preparation of
all types of ink, the weight of the ingredients, and
the description of the treatment for each of them.
And here it is:

	Cooked	Squeezed	Infused	Powder
Gallnuts	1 part	2 parts	2 parts	1 part
Gum arabic	1 part	1 part	½ part	1 part
Vitriol	¼ part	1/10 part	¼ part	½ part
Water	1 part	2 parts	3 parts	1 ½ parts

This represents their definition and preparation and
every type of ink is prepared according to this
description; it helps to remind us of their
effectiveness and their purpose. The first thing you
need to learn is that when you increase the gallnuts
according to the parts in the chart this will speed
up the writing [...] . And as for the properties of the
gallnuts, they strengthen the effectiveness of the
ink; as for gum, it makes it bright with its action; the
vitriol, instead, fixes its trace to the desired point;
these are the levels of their purposes and their
effectiveness.

منافع كل واحد من أنواعه:

المَطْبُوحُ يَصْلُحُ لِلكَاغِدِ وَحَدَهُ، وَالْمَعْصُورُ يَصْلُحُ
لِلكَاغِدِ وَالرَّقِّ، وَالْمَنْقُوعُ يَصْلُحُ لِلرَّقِّ خُصُوصًا
العُبارِ لِلأَقْرَاصِ يُكْتَبُ بِهِ مِنْ حِينِهِ. فَهَذِهِ أَصُولُ
الْأَمِدَّةِ وَيُحْتَاجُ إِلَى حَوْزِ قَانُونٍ فِي مِقْدَارِ أوزَانِهَا
وَكَيْفِيَّةِ صَنَعَتِهَا فَيَجِبُ أَنْ يَحْرَزَ الأَجْزَاءَ فَمَا زادت
فسد، فأما السبب الذي من أجله يتحفظ على أوزان
الأدوية فيبقى منها في الدواء المؤلف مقدار كثير
ومقدار يسير، مثال ذلك إذا كان الدواء الذي يبقى
شديدًا [...] ينبغي أن يبقى منه مقدار يسير وإذا كان
ضعيفًا ينبغي أن يلقى منه مقدار كثير يستدرك
بالزيادة في مقدار ما يدخله من نقصان في كفيته
[...].

Properties of each typology:

[The ink obtained] with the decoction [of gallnuts] is
suitable only for paper; the one obtained by
squeezing is fine for paper and parchment; the one
obtained by infusion is particularly suitable for
parchment; pulverization is suitable to obtain pellets
with which to write when needed. These are the
principles [that regulate the use] of the inks, but it is
necessary [also] to acquire a norm related to the
weight measurements and the ways of preparation.
You must keep the proportions: the excesses ruin
the mixture. As for the reason for this, it lies in the
principle of measurements of medicines: a
maximum and a minimum measure of the
substances are established in the medicines they
make up; an example of this is when the substance
is strong [...] it is necessary to add a minimum
quantity of it, while if it is mild, it is necessary to add
a maximum quantity, trying to correct with this
increase of measure what affects it in terms of
qualitative deficiency [...].

القول على العفص:

منه الشامي الفج الأسود الذي [...] غير مثقوب ومنه
 آخر أملس خفيف أحمر مثقوب وهو أقل قيصاً من
 الشامي ومما يؤخذ من شجره وهو غض صغير
 نضج وهو الرومي، والمختار منها ما كان وزينا إذا
 كسرته رأيتَه [...] عا صافيا والصمغ العربي ثلاثة
 أنواع أبيض وأصفر وأحمر، وأجوده الأبيض
 الصافي الذي خلقته كخلقة الدود وكان صقيلاً براقاً
 يكاد البصر أن ينفذه لصفائه ومشاكلته لصفاء الزجاج
 والزجاج أنواع منه القلطار، ويقال له زجاج الأساكفة
 والمختار منه ما كان سريع التفتت نقياً من الحجارة
 ومنه صنف [...] وهو أسود [...] وهو أصلب من
 [...] ومنه صنف يقال له القلقنت ولونه أخضر و
 [...] أش [...] د [...] حرارة من هذين الصنفين وهو
 الزجاج الفارسي و [...] وما كان لونه لون اللازورد
 وكان [...] نقياً صافياً وهذه أمزجة الأمدة وبها تصلح
 إن شاء الله تعالى كما قال ابن عدكان:

إنَّ المِدادَ به تعلم ما ترى: وحي الإله وعلم دين واجب
 لولا المِدادُ وحسن رونق مائه ما تمَّ شيءٌ من كتابه كاتب
 ولما تبيَّنت الأمور لعالم وكان شاهدُ أمره كالعائب

The remark about the gallnuts:

Among these are the Syrian ones, unripe and black which [...] have no holes, and another smooth kind, light, red and with holes that break less easily than the Syrian ones; there are also those that are collected from the tree when they are still fresh, small and ripe: these are the Greek ones. The best of these are the nonheavy ones: when you break them you see their [...] clean. Also the gum arabic is of three types: white, yellow and red. The best is the pure white one, which forms with the aspect similar to small bugs: it is smooth, bright, barely noticeable to the eye for its purity, as it is similar to glass. Among the various types of vitriol there is the *qulquṭār* which is called vitriol of the shoemakers: the best is the one that reacts quickly, and which is free of stone residues. Among the vitriols there is also the type [...] which is black [...] and harder than [...]. There is also a type called *qalqant*, of green color [...] the heat compared to these two types: it is the Persian vitriol [...] its color is not that of lapis lazuli and it is [...] clear and pure, and these are the constituents of the inks with which you will obtain good results, if God wills. And, as Ibn 'Adkân said:

By means of the ink you learn what you see:

the revelation of divinity and knowledge of religion.

If it were not for the ink and the splendour of its fluid

the scribe would never finish his writing.

And when a wise solves the questions

[the ink] is witness of his work, secretly.

[Q II] – MIDĀD DIFFERENT FROM THE BLACK ONE

[Q II.1]

مِدَاد أَخْضَر:

يُؤَخَذُ مِنْ مَاءِ الْعُقْصِ غَيْرِ الْمَنْقُوعِ عَلَى مَا ذُكِرَ،
يُسْحَقُ فِيهِ الرَّنْجَارُ مَعَ قَلِيلِ حَلٍّ وَيُضَافُ لَهُ قَلِيلُ
رَعْفَرَانَ وَصَمْغِ عَرَبِيٍّ وَيُسْتَعْمَلُ.

Green midād:

Take water of non-macerated gallnuts, as described, add verdigris with a little vinegar and grind it, then add saffron and gum arabic and use it.

[Q II.2]

مِدَاد أَصْفَر:

يُؤَخَذُ مَاءُ الْعُقْصِ وَيُسْحَقُ فِيهِ الرَّزْنِيخُ الْأَصْفَرُ
وَيُضَافُ إِلَيْهِ مِنَ الصَّمْغِ مِقْدَارُ الْحَاجَةِ.

Yellow midād:

Take water of gallnuts and grind orpiment in it; finally add gum arabic in the needed quantity.

[Q II.3]

صَفَاةٌ أُخْرَى:

يُؤَخَذُ مِنَ الرَّزْنِيخِ الْأَحْمَرِ ثَلَاثَةَ أَجْزَاءٍ وَمِنْ
الرَّعْفَرَانَ جِزْءٌ وَمِنْ الصَّمْغِ الْعَرَبِيِّ جِزْءٌ يُحَلُّ
الْجَمِيعُ بِالْمَاءِ وَيُسْتَعْمَلُ.

Another method:

Take three parts of realgar, one part of saffron and one part of gum arabic; dissolve everything with water and use it.

[Q II.4]

مِدَاد يَاقُوتِي:

يُؤَخَذُ مِنَ الزَّنْجَفُورِ مِقْدَارُ مَاءٍ وَيَسْحَقُ وَيُعْسَلُ
وَيُنْرَكُ وَيَنْزَلُ وَيُضْرَبُ مَا تَعَقَّدَ مِنْهُ بِمَاءِ الْعُقْصِ
وَالصَّمْغِ وَيُخَلَطُ مَعَهُ مِنْ مَاءِ طَبِيخِ رَجُلِ الْحَمَامِ مَا
يَكْفِيهِ وَيُسْتَعْمَلُ.

Garnet-colour midād:

Take cinnabar in the same amount of water and grind it; purify it, leave it to rest and then take it; pound the thickened part of it with water of gall nuts and gum; mix it with enough cooking water of dyer's alkanet and use it.

[Q II.5]

مِدَاد أَزْرَق:

تُطَبِّخُ الضَّفِيرَةُ طَبْخًا بَلِيغًا وَيُضَافُ إِلَى صَفْوِهَا شَيْءٌ
مِنْ مَاءِ الْعُقْصِ الصَّافِي وَالصَّمْغِ وَيُسْتَعْمَلُ.

Blue midād:

Cook maidenhair fern and add to its filtered part cleared water of gallnuts and gum, then use it.

[Q II.6]

مِدَادٌ شَحْمِي:

يُؤَخَذُ مِنْ مَاءِ الْعُقْصِ الْمُرَبَّبِ بِالصَّمْغِ مِقْدَارُ مَا يُرَادُ
وَيُوضَعُ فِي إِنَاءٍ نَظِيفٍ وَيُلْقَى عَلَيْهِ مِنَ الْبَيَاضِ
الْأَبْيَضِ بِمِقْدَارِ مَا يُرَادُ لَوْنُهُ وَيُسْتَعْمَلُ.

Grease-colour midād:

Take the desired amount of water of gallnuts, to which gum has been previously added. Put it inside a clean vase and add white lead in the necessary quantity to obtain the right colour and use it.

[Q II.7]

مَدَادٌ بِنَفْسَجِي:

يُؤْخَذُ مِنَ الْعَكْرِ الْخَالِصِ مِقْدَارُ الْحَاجَةِ وَيُضَافُ إِلَيْهِ مِنَ النَّيْلِجِ الْخَالِصِ مِقْدَارُ مَا يَحْسَنُ لَوْنَهُ وَيُصَفَّى وَيُسْتَقَى مِنْ مَاءِ الصَّمْغِ بِقَدْرِ الْكِفَايَةِ وَيُسْتَعْمَلُ.

Violet midād:

Take the needed quantity of pure carthamine⁸ [safflower] and add pure indigo in the right quantity for the colour you want to obtain; filter it and dampen it with dissolved gum arabic in the needed quantity; finally use it.

[Q II.8]

مَدَادُ اللَّازُورِدِ:

يُؤْخَذُ مِنَ اللَّازُورِدِ مِقْدَارٌ وَيُصَبُّ عَلَيْهِ مِنَ الْمَاءِ مَا يَغْمُرُهُ وَيُضْرَبُ بِهِ ضَرْبًا جَيِّدًا وَيَتْرَكُ حَتَّى يَنْزِلَ وَيُصَبُّ ذَلِكَ الْمَاءُ عَنْهُ وَيُصَبُّ عَلَيْهِ مَاءُ الْعَفْصِ مَعَ مِخِّ بَيْضَةٍ وَيُلْقَى عَلَيْهِ مِنَ الصَّمْغِ مَا يَحْتَاجُ إِلَيْهِ وَيُسْتَعْمَلُ.

Blue midād:

Take a certain quantity of lapis lazuli and add water to cover it; pound it energetically and leave it to rest until it deposits; pour the water off the sediments and pour over it the macerated gallnuts with egg yolk; add the necessary quantity of gum arabic and use it.

[Q II.9]

الْمَدَادُ الْمِصْرِيُّ:

يُؤْخَذُ مِنَ الْعَكْرِ الطَّيِّبِ الْخَائِرِ الْمُلَوَّنِ وَيُلْقَى فِي قَارُورَةٍ مِنْ عُودِ الدِّقْلِيِّ لَيْلَةً تَشْرَبُ الْمَاءَ مِنْهُ وَيَبْقَى الطَّيِّبُ فَيُلْقَى عَلَيْهِ الصَّمْغُ وَيُسْتَعْمَلُ.

Egyptian midād:

Take some good carthamine of intense colour and put it in a bottle made of oleander wood, until the bottle absorbs the humid part and only the useful part remains; add the gum to this and use it.

[Q II.10]

مَدَادٌ يَأْتِي كَالذَّهَبِ، فِي الرَّقِّ خَاصَّةً:

يُؤْخَذُ ... مِنْ زَرْبِيخٍ أَصْفَرٍ فَيُسْحَقُ وَمِثْلُهُ زَعْفَرَانٍ لَمْ يَمْسُهُ زَيْتٌ وَيُصَرَّ الزَّعْفَرَانُ خَرْقَةً وَيُجْعَلُ فِي قَلِيلِ مَاءٍ حَتَّى تَبْتَلُ الصَّرَّةَ نَعْمًا ثُمَّ تُعْصَرُ عَلَى الزَّرْبِيخِ وَيُخَطُّ مَعَ الْجَمِيعِ شَيْءٌ مِنْ مَاءِ الصَّمْغِ وَيُسْتَعْمَلُ.

A midād that appears like gold, in particular on parchment:

Take [...] of orpiment and grind it; then take the same quantity of saffron that was not contaminated with oily substances, wrap it with a piece of tissue, and immerse it in water until the wrap is well soaked; squeeze it over the orpiment and mix everything with melted gum, then use it.

(...)

[Q VIII]

فَصَلْ فِي اللَّيْقَةِ وَالنَّشَارَةِ وَالطِّينِ الَّذِي يَعْلَمُ بِهِ وَالطَّلَاءِ الَّذِي يُطْلَى بِهِ عَلَى الْخَطِّ

أَمَّا اللَّيْقَةُ فَتُسْتَعْمَلُ مِنْ ثَلَاثَةِ أَشْيَاءَ: مِنَ الْقَطْنِ الْجَدِيدِ وَالْقَطْنِ الْبَالِيِّ وَمِنَ الْحَرِيرِ وَأَحْسَنُهَا لَيْقَةُ الْقَطْنِ الْجَدِيدِ؛ فَإِنَّهُ أَرْطَبُ مِنَ الْبَالِيِّ وَأَبْقَى، وَلَيْقَةُ الْبَالِيِّ تَنْفَشُ فِي الدَّوَاةِ فَلَا يَخْلُو رَأْسَ الْقَلَمِ مِنْ شَعْرَةٍ تَعْلُقُ بَيْنَ شَفَتَيْهِ وَرَبْمَا خَفِيَتْ عَنِ الْعَيْنِ لِرِقَّتِهَا فَغَيَّرْتَ الْخَطَّ وَإِذَا اسْتَعْمَلْتَ مِنَ الْحَرِيرِ فَكَذَلِكَ أَيْضًا لَا يَأْمَنُ

Chapter on the *līqa*, the sawdust [to dry the ink], the clay for learning [to write], and the coating of the script.

As for *līqa*, this is obtained from three materials: from fresh cotton, from worn cotton, and from silk. The best of these is the one made of fresh cotton, since it soaks better and remains wet longer; while the one made by older cotton swells in the inkpot and the lints do not detach from the tip of the *qalam* and they remain stuck between its two thin teeth; sometimes they remain hidden as they are very fine and ruin the writing. Also, when using the one made

⁸ 'Akar in the text, while the flower is 'usfur. Possibly, *Carthamus tinctorius*.

الكاتب من شعرة وأحسنها ما كانت من القطن الجديد.

وأما النشارة فتكون من كل عود صلب وأحسنها ما كان من العود البقسي متوسطة لأن ما دق منها يلتصق بالمِداد فيعجميه ويغير خطه وما خشن منها فليس ينشف ويفسد الحروف وأحسنها نشارة البقس ولا خير في نشارة الأبنوس لأنها تذهب بصيص المِداد وقد تنتخب النشارة للسلطين على مثال ما انتخبها بعض الكتاب لبعض الأمراء وذلك أنه أخذ من نشارة البقس الفتي المتوسطة مثلاً وأخذ من حب البلسان مقدار نصف عشرها ودقه في الهاون دقاً ناعماً حتَّى صار غباراً وخلطه بالنشارة حتَّى التأم، فهذه النشارة تفوح اليد والكتاب ويقوي رائحتها الدماغ وهي عجيبة وتفتح المسام وتستطرف.

[...]

وأما الطلاء الذي يطلى على الخط إذا كره البشر فهو أن تأخذ بياضاً أبيض زنة معلومة وتسحقه سحقاً بالغاً وتنخله بحريرة ثمَّ خذ وزنه صمغاً منقى من خشبه وقدره وتبله بشيء من ماء قليل ولا تكثر ودعه يذوب ثمَّ اعجن به البياض الذي نخلته عجنًا شديدًا وصيره شبه البنادق واجعله في فخّارة صغيرة ودعه يجف فيها فإذا احتجت إليه فقطر فيه نقطة ماء فرات ثمَّ حركه بطرف قلم نظيف ليس عليه مِداد ثمَّ اطله حيث الخط ولا تطله حتَّى يجف المِداد ثمَّ دعه ساعة حتَّى يجف جيّدًا ثمَّ اكتب عليه ما شئت.

of silk, in the same way, the *kātib* is not safe from the lints. The best one is that made of fresh cotton.

As for sawdust, this can be from any wood, but the better one is that of boxwood of medium grain because no particle sticks to the ink, it does not make it rough, it does not impregnate, nor spoils the lettering. The best one is that of boxwood, while there is nothing good in that of ebony because it eliminates the brightness of the ink. You can also choose to use the 'sawdust of the sultans' according to what some *kātib* prepared for some princes: that is to take medium sawdust from fresh boxwood, for example; then take seeds of balsam in the measure of half a tenth of the sawdust and grind it finely in a mortar until they become powder, then mix them with the sawdust until they are well blended. This sawdust perfumes the hand and the book and its good odour stimulates the brain and opens the pores. You will find it pleasant.

[...]

As for the coating that is applied on the writing when someone writes incorrectly, take some white lead, grind it finely and sift it with a piece of silk. Then take the same weight of purified gum from its wood rests and from the pot and moisten it with a little bit of water, without exaggerating, and dissolve it. Then energetically mix it with the white lead that was sifted and with it make little balls similar to hazelnuts; put them in a small terracotta vase and leave it to dry. When you need it, add a drop of sweet water, then stir them with the tip of a clean *qalam*, on which there is no traces of ink; then coat the preparation over the writing, but not before the ink has dried. Finally put it to dry well for an hour and then write on it whatever you want.