

SURGERY IN ARABIC ASPECTS OF A TECHNICAL TERM

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In the present paper an attempt will be made to interpret the expressions *al-‘ilāğ bi-l-ḥadīd bi-l-yad* and *‘ilāğ al-ḥadīd bi-l-yad*, respectively, which appear once in the Arabic translation of Galen’s *De anatomia mortuorum*. The various renderings of the Greek stem *cheirurg-* in the Arabic translations of Galen’s works will be checked. Then the expressions *al-‘ilāğ bi-l-yad* and *al-‘ilāğ bi-l-ḥadīd*¹ will be interpreted and their relationship determined. In order that our conclusions may be based on a wider-ranging corpus, we will also subject to analysis the use of the two expressions in az-Zahrāwī’s *Surgery*.

In the Arabic translation of Galen’s *De anatomia mortuorum*² there appear, once each, the expressions *al-‘ilāğ bi-l-ḥadīd bi-l-yad* and *‘ilāğ al-ḥadīd bi-l-yad*, along with two occurrences of the common form *‘ilāğ al-yad*. It is well known that both *‘ilāğ al-yad* and *‘ilāğ al-ḥadīd* are equivalents of the Greek *cheirurgía*; our aim here will be to find out what exactly the “compound forms” in question mean: forms that seem to be unique to this Arabic text. (They have not been traced anywhere else in the available Arabic translations of Galen’s works.) With this aim in mind, all occurrences of the stem *cheirurg-* in Galen’s Greek corpus,

¹ These expressions appear variously as *‘ilāğ al-yad*, *al-‘ilāğ bi-l-yad*, *‘amal al-yad*, *al-‘amal bi-l-yad*, etc., also in conjugated forms such as *ya‘malūna bi-l-ḥadīd*, *‘alighu bi-l-ḥadīd*, etc., or in participles such as *mu‘alighū l-ḥadīd*, etc. We will be interested mostly in the second constituent part of these expressions (*yad/ḥadīd*), and we adopt therefore a simplified reference method in that it will be tacitly assumed that a reference to one form will be valid for all the other forms as well.

² The Greek original of this work is lost; the Arabic translation is being prepared for publication by the present writer. See Ormos 1993.

as well as the Arabic renderings of these, were checked where they could be found. Then the expressions *al-ʿilāğ bi-l-ḥadīd* and *al-ʿilāğ bi-l-yad* were checked in those works of Galen which survive in Arabic translation only.

The Thesaurus Linguae Graecae TLG CD ROM "C" (University of California Irvine) produced a list of 191 occurrences of the stem *cheirourg-* in the Greek corpus of Galen (Group A)³; I have been able to check 61 Arabic equivalents of these (Group B)⁴ and another 15 Arabic expressions in translations where the Greek original is lost (Group C)⁵. There are some further Arabic translations which were not at my disposal⁶, but I hope that, notwithstanding this limitation, the results of this paper will be convincing.

³ I am indebted for this list to István Kapitánffy from the Department of Greek Language and Literature, Budapest University. Most of the references in this list are to Kühn's edition (Galen, *Opera*); whenever later editions were available, we checked them, too.

⁴ For the Arabic equivalents the following works were consulted: *De sectis*: Galen, *Firaq*; *De anatomicis administrationibus*, Books i-iv: Galen, *Anat. adm.*, ed. Garofalo; *id.*, Books v-ix: Galen, *Anat. adm.*, MS Brit. Mus. (this manuscript was occasionally consulted for Books i-iv, too); *De venarum arteriarumque dissectione*: Galen, *Ven. art. diss.*, MS Berlin; *De usu partium*: Galen, *De usu partium*, MS Paris; *De symptomatum causis*: Galen, *Sympt. caus.*, MS Paris; *De locis affectis*: Galen, *Loc. aff.*, MS Wellcome; *De methodo medendi*: Galen, *Meth. med.*, MS Paris; *Ad Glauconem de medendi methodo*: Galen, *Galawqan* (there are some useful quotations from manuscripts in the footnotes); *In Hippocratis De officina medici commentarii*: Galen, *Off. med.* - I am indebted to the abovementioned libraries and institutions for providing me with microfilms of their manuscripts and allowing me to use them.

⁵ These were found in the following two works: *De anatomicis administrationibus*, Books x-xvi: Galen, *Anatomie* and MS British Museum; *De optimo medico cognoscendo*: Galen, *Examinations*.

⁶ These include *De semine*, *De usu pulsuum*, *De dignoscendis pulsibus* (?), *De methodo medendi* (Books x-xiv), *Ad Glauconem de medendi methodo*, *De compositione medicamentorum secundum locos*, *De compositione medicamentorum per genera*, *In Hippocratis De victu acutorum commentaria*, *In Hippocratis Epidemiarum libros commentaria*, *In Hippocratis Aphorismos commentarii*, *In Hippocratis Prognosticum commentaria*.

If we check Groups B and C, we find that the expressions *al-ʿilāğ bi-l-ḥadīd bi-l-yad* and *ʿilāğ al-ḥadīd bi-l-yad* do not appear in them. If we check Group A, we find that derivatives of the Greek stem *cheirurg-* do not appear anywhere in a combination or context that would easily lend itself to a rendering that would result in the forms in question. Consequently, the only plausible solution to this problem is to suppose that this compound expression is an invention of Ḥubayš, the translator of our work, whose predilection for the use of hendiadys (in our case two closely related words, eventually synonyms, occurring indivisibly together to express a single concept) is only too well known⁷. (For the eventual relationship between *al-ʿilāğ bi-l-yad* and *al-ʿilāğ bi-l-ḥadīd*, see below.) The other possibility, which we omit from consideration here, would be to suppose that the expression in question is in fact unique to *De anatomia mortuorum*; in other words that the two occasions where it occurs here are the sole two in the whole of Galen's immense oeuvre - excepting of course the possibility of other works which do not survive. Although not impossible, this supposition is hardly plausible if we take into consideration that *cheirurg-* is a rather common stem and that Galen, too, is famous for his love of repeating himself countless times.

If we take a close look at these lists, interesting observations can be made. First of all, in the Greek Galenic corpus, *cheirurgía* and its derivatives do not correspond exactly to the modern technical term *surgery* and its derivatives⁸. As the word has the basic meaning to *perform with the hands, to execute with the hands*, it will be very often used, even within our Galenic corpus of mainly medical texts, for concepts which lie outside the range of modern surgical operations: together with its derivatives it is used for anatomical dissection of a dead

⁷ See Bergsträsser 1913:41, 50f. Cf. Beeston 1970:112.

⁸ It may be noted here that English *surgery* comes ultimately from Greek *cheirurgía* via Middle English, Old French and Latin. See Onions 1982:889b (s. v. *surgeon*).

animal⁹, for anatomical dissection of a living animal, i. e. vivisection, for various activities performed by the hands, for manual skill and even manufactured articles. Its use is by no means restricted to medicine: it is used for the execution of acts of violence, for the act of building something, for the practice of an art, especially of music, for producing something by art, e. g. for hatching eggs by artificial means, etc. (Liddell-Scott 1985:1986). It can also be replaced by a synonym such as *egcheir̄ēsis*, too: in our corpus this happens twice when *cheirourgía* denotes vivisection¹⁰. The verb *cheirízō* also appears in a similar role in the Galenic corpus¹¹. Note the similar etymology of the words in both cases (*cheír*)!

Thus we can state that in Greek, *cheirourgía* and its derivatives had established themselves as technical terms to a considerable extent by Galen's time: he repeatedly refers to *cheirourgía* as one of the basic branches of medicine alongside treatment by diet and by medicaments¹². However, probably owing to its transparent structure, clear etymology and relatively common, simple meaning, it had not become an exclusive technical term of medicine for speakers of Greek by Galen's time, i. e. it had not attained the status of loan word of foreign origin and unanalysable structure as was later the case in most European languages.

⁹ The word *animal* is used here in the meaning "any living organism typically capable of moving about but not of making its own food by photosynthesis: distinguished from *plant*", i. e. it includes human beings as well. See Webster 1958:58.

¹⁰ *De anatomicis administrationibus* VII, 12: Galen, *Opera* II, 630.4; 639.4f.

¹¹ For instance, see *In Hippocratis De officina medici commentarii* I, 19: Galen, *Opera* XVIII B, 700.15(twice); 701.1f.(twice) [all four are quotations from Hippocrates]; 707.3f.

¹² See *Thrasylbulus* XXIV: Galen, *Scr. min.* III, 62.19f.; 63.20f. = Galen, *Opera* V, 847.9f.; 848.16f.; *De compositione medicamentorum per genera* III, 2: Galen, *Opera* XIII, 604.8f.; *In Hippocratis De victu acutorum commentaria* I, 5, 16: Galen, *Hipp. victu* 120.17-20; 131.9f. = Galen, *Opera* XV, 425.9-12; 447.4ff.; *In Hippocratis De officina medici commentarii* III, 31: Galen, *Opera* XVIII B, 883.3ff.

At this time Arabic produced a literal translation of *cheirurgia*: 'amal al-yad, or more freely 'ilāğ al-yad. As we turn to Groups B and C, we find that it is exactly the expression that recurs in our texts most often. There is, however, no one-to-one correspondence between 'amal al-yad / 'ilāğ al-yad and *cheirurgia*: often 'amal alone will be used¹³, often only 'ilāğ¹⁴, and on one occasion we find *mudāwāt*¹⁵. Sometimes the exact method of manipulation is more clearly stated: (*fī mawādi*) *al-batt wa-l-qat*¹⁶; *fī battihā wa-qat'ihā*¹⁷; *fī l-batt wa-š-šaq*¹⁸; *bi-l-batt wa-ğayrihī min 'ilāğ al-ğirāhāt*¹⁹. (Note that *yad* does not appear in these four examples!) The last example leads us on to the compounds with *ğirāhāt*: 'ilāğ *ğirāhāt* (+gen.)²⁰; 'amal *al-ğirāhāt*; *ašhāb al-ğirāhāt*

¹³ E. g. *De anatomicis administrationibus* I, 5; VII, 12(twice), 14: Galen, *Anat. adm.*, ed. Garofalo 42.10; *id.*, MS Brit. Mus. 124v8, 125r4; 126v-5 (= *id.*, ed. Garofalo 41,11 [= Galen, *Opera* II, 251.13]; *id.*, II, 628.13; 630.3; 636.15).

¹⁴ E. g. *De anatomicis administrationibus* II, 2(twice); III, 1, 9; IV, 1: Galen, *Anat. adm.*, ed. Garofalo 76.6; 78.13; 136.21; 188.20; 210.3 (= *id.* 75.6; 77.15f.; 135.28; 187.25; 209.4 = Galen, *Opera* II, 284.6; 286.11; 345.11; 395.14; 417.2).

¹⁵ *De anatomicis administrationibus* VII, 13: Galen, *Anat. adm.*, MS Brit. Mus. 125v-2 (= Galen, *Opera* II, 633.8f.).

¹⁶ *De anatomicis administrationibus* III, 1: Galen, *Anat. adm.*, ed. Garofalo 134.16 (= *id.* 133,18 = Galen, *Opera* II, 343.3).

¹⁷ *De anatomicis administrationibus* III, 1: Galen, *Anat. adm.*, ed. Garofalo 138.10 (= *id.* 137.10f = Galen, *Opera* II, 346.8f.).

¹⁸ *De anatomicis administrationibus* III, 5: Galen, *Anat. adm.*, ed. Garofalo 178.17 (= *id.* 177,18 = Galen, *Opera* II, 386.7).

¹⁹ *De anatomicis administrationibus* III, 1: Galen, *Anat. adm.*, ed. Garofalo 132.19f (= *id.* 131,23 = Galen, *Opera* II, 341.12f.).

²⁰ *De venarum arteriarumque dissectione* VII: Galen, *Ven. art. diss.*, MS Berlin 85r5 (= Galen, *Opera* II, 803.15).

²¹ *De venarum arteriarumque dissectione* VII: Galen, *Ven. art. diss.*, MS Berlin 84v13 (= Galen, *Opera* II, 803.4).

*min al-atibbā'*²²; *min mu'aliḡī l-ḡirāhāt al-maḡānīn*²³. When the subject matter is the dissection of a dead or living animal, the various forms of the verb *šarraḡa* will be occasionally used²⁴, whereas in one place no equivalent of *cheirourgia* appears in the Arabic version at all²⁵. The great variety of similar words and expressions used in identical or similar roles to render one and the same Greek word shows that none of these has yet attained the status of a technical term in the modern sense of the word. Another important family of expressions is that of the compounds with *ḡadīd*: *ilāḡ al-ḡadīd / al-'ilāḡ bi-l-ḡadīd*. Their number is, however, considerably lower in our corpus (Groups B and C) than that of the compounds with *yad*: compounds with *ḡadīd* occur seven times²⁶ as against twenty-one occurrences of those with *yad*²⁷.

²² *De anatomicis administrationibus* IV, 1: Galen, *Anat. adm.*, MS Brit. Mus. 60r1 (= Galen, *Anat. adm.*, ed. Garofalo 211.11 = Galen, *Opera* II, 419.4). *Sic!* The form in Galen, *Anat. adm.*, ed. Garofalo 212.7f. seems to be a misprint.

²³ *De methodo medendi* V, 4: Galen, *Meth. med.*, MS Paris 129v17 (= Galen, *Opera* X, 323.9).

²⁴ *De anatomicis administrationibus* V, 7; VI, 1; VII, 12: Galen, *Anat. adm.*, MS Brit. Mus. 87v2; 97v5; 124v-3 (= Galen, *Opera* II, 512.1; 541.11; 629.12).

²⁵ *De usu partium* X, 11: Galen, *De usu partium*, MS Paris 181v (= *id.*, ed. Helmreich II, 91.26 = Galen, *Opera* III, 810.17).

²⁶ *De anatomicis administrationibus* VIII, 7: Galen, *Anat. adm.*, MS Brit. Mus. 140r7 (= Galen, *Opera* II, 685.5); *De locis affectis* I, 6 (twice); IV, 9: Galen, *Loc. aff.*, MS Wellcome 21v7; 22r6f.; 106v6 (= Galen, *Opera* VIII, 54.5; 55.9f.; 268.6); *De methodo medendi* IV 4: Galen, *Meth. med.*, MS Paris 103r5 (= Galen, *Opera* X, 250.13); *Ad Glauconem de medendi methodo* II, 12 (twice): Galen, *Glauc.*, MS Paris 108r17-20 (twice) = *id.*, MS Teheran 170v9-13 (twice) (= Galen, *Opera* XI, 141.5 [twice]).

²⁷ *De sectis* 6, 9: Galen, *Firaq* 52.5; 90.3 (= Galen, *Scr. min.* III, 15.9; 31.25 = Galen, *Opera* I, 83.7; 105.4); *De anatomicis administrationibus* I, 3 (three times); III, 9; VII, 12, 14; VIII, 7: Galen, *Anat. adm.*, ed. Garofalo 15.21, 22; 17.2; 187.15 (= *id.* 16.17f., 19; 18.3; 188.12 = Galen, *Opera* II, 228.13, 14; 229.6; 395.2); Galen, *Anat. adm.*, MS Brit. Mus. 125r9; 126r-9; 140r7 (= Galen, *Opera* II, 630.12f.; 634.14; 685.5); *De usu partium* III, 3 (twice): Galen, *De usu partium*, MS Paris 43r2, 5f. (= *id.*, ed. Helmreich I, 133.11, 14f. = Galen, *Opera* III, 182.8, 11); *De locis affectis* IV, 9: Galen, *Loc. aff.*, MS Wellcome 106v10 (= Galen, *Opera* VIII, 268.10); *In Hippocratis De officina medici commentarii* II, 7 (twice); III, 28,

The next question which presents itself is: are the compounds with *yad* interchangeable with those with *ḥadīd* or are they not? And if the answer turns out to be negative, then what is the difference between the two sets? On the basis of the expressions at our disposal, no conspicuous difference could be detected at first sight. As a first approach we supposed that there was no difference in meaning between the two compounds in question and thus that they were fully interchangeable. We endeavoured to detect the eventual basis of the differences in the distribution of these two compounds in the various works: we took into consideration 1) the translators²⁸ a)) of both the Syriac and Arabic versions; b)) only those of the Syriac from the Greek, c)) only those of the Arabic from the Syriac; 2) *when* the translations were made²⁹; 3) the age of the manuscripts containing the works in question. No convincing result could be obtained: it was impossible to account for the actual differences in distribution of the abovementioned terms³⁰. At a later stage we came round to the idea that the two expressions were not wholly interchangeable, i. e. that there was some difference in meaning between the two: *aṣḥāb ʿilāğ mā yuʿālağ bi-l-ḥadīd wa-ğayribi min ʿamal al-yad / cheirourgoīs*³¹ seems to imply that the semantic field of *ʿamal al-yad* is wider than that of *al-ʿilāğ bi-l-ḥadīd*; the latter seems to be included in the former.

29(twice), 31, 36(twice): Galen, *Off. med.*, 14.8, 8f.; 54.9; 56.6, 13; 58.22; 86.26; 88.19, 20 (=Galen, *Opera* XVIII B, 743.1, 2; 878.6; 879.18; 880.6f.; 883.4f.; 914.15; 916.3). Note that *De anatomicis administrationibus* VIII, 7: Galen, *Anat. adm.*, MS Brit. Mus. 140r7 (=Galen, *Opera* II, 685.5) belongs to both types!

²⁸ They were determined on the basis of Ḥunayn's Missive, see Ḥunayn, *Übersetzungen*. See also the additions in Sezgin 1970.

²⁹ Approximately; relying on the information supplied by Ḥunayn in his Missive, see the preceding footnote.

³⁰ Our only finding was that there seemed to be a very vague predilection for the use of compounds with *yad* in older manuscripts.

³¹ *De anatomicis administrationibus* VIII, 7: Galen, *Anat. adm.*, MS Brit. Mus. 140a7 =Galen, *Opera* II, 685.5.

Thus for the sake of having at our disposal a considerably wider-ranging corpus, we chose to check az-Zahrāwī's³² *maqāla* on surgery³³ in this respect, hoping that our findings there might eventually be extended to the Galenic corpus too. Az-Zahrāwī (died around 400/1009) was about 130 years Ḥunayn's (192 – 260 or 264 / 808 – 873 or 877) junior and we are perhaps allowed to extend our investigations to the survey of his lexicon as far as technical or semi-technical terms are concerned.

Having gone through the whole *maqāla* on surgery, we found that *surgery* is rendered by az-Zahrāwī, just as by Ḥunayn and his circle, by compounds with *yad* and *ḥadīd*, the latter, however, slightly surpassing the former in quantity, which forms a contradistinction to Ḥunayn and his circle: in az-Zahrāwī we found 17 compounds with *ḥadīd*³⁴ against 12 with *yad*³⁵, e. g. *al-ʿamal bi-l-yad* (az-Zahrāwī, *Surgery* 7.36, 48, 477.3) the title of the whole *maqāla* is also *ḡuz' al-ʿamal bi-l-yad* (*id.* 3.3); *šināʿat al-yad* (*id.* 3.15; 561.82); *ʿilāḡuhā bi-l-yad wa-bi-l-adwiya* (*id.* 527.3); *al-ʿamal bi-l-ḥadīd* (*id.* 235.18); *yūʿālaḡ bi-l-ḥadīd* (*id.* 383.3; 449.7); *ʿilāḡuhā bi-l-ḥadīd* (*id.* 369.11); *min ʿilāḡihī bi-l-ḥadīd* (*id.* 381.3; 467.29); *al-bur' bi-l-ḥadīd* (*id.* 505.24); *fa-lā taʿriḍ lahū bi-l-ḥadīd* (*id.* 265.6); *fa-innahū lā yanbaḡī an yuʿrad lahū bi-l-ḥadīd al-batta* (*id.* 5.34); *wa-lā yuqrab bi-l-ḥadīd* (*id.* 383.4). At the same time, again just as in the Arabic Galen, *ʿilāḡ* and its other forms very frequently occur alone as well as in a series of various constructions: *fa-yuʿālaḡ bi-r-raṣās* / “should

³² On az-Zahrāwī, see Sezgin 1970:323ff., and Ullmann 1970:149ff.

³³ We used the following edition: az-Zahrāwī, *Surgery*; on this edition, see Savage-Smith 1976:245-256. Occasionally we checked az-Zahrāwī, *Traktat*, which contains the facsimile of a manuscript unknown to Spink and Lewis, and also az-Zahrāwī, *Presentation*, which contains the facsimile of MS 502 of the Beşirağa Collection, Süleymaniye Library, Istanbul, which had been only partly collated by Spink and Lewis; see az-Zahrāwī, *Surgery*, xiii.

³⁴ az-Zahrāwī, *Surgery* 5.34; 235.18; 265.6; 369.11; 381.3; 383.3, 4, 8; 425.19; 441.14f.; 447.2; 449.7; 463.7; 467.29; 505.24; 595.6; 785.16.

³⁵ *id.* 3.3, 4, 15; 7.36, 48; 411.4; 421.6; 477.3; 483.64f.; 527.3; 553.19; 561.82.

be treated by the leaden sound"³⁶; *tumma yu'ālağ bi-šarāb qābid* / "then let it be dressed with some styptic wine" (id. 395.25=394.13); *fa-āliğhu bi-l-ħuqna* / "then treat it by irrigation" (id. 583.11=582.14); *āliğhu bi-ilāğ al-awrām* / "treat as an abscess" (id. 603.20=602.1); *fa-āliğhu bi-nafđ al-badan wa-mā yanfi r-riyāh wa-yafuššuhā* / "then treat by purging of the body and by medicines dispelling and getting rid of flatus" (id. 607.19=606.25f); *tumma tu'āliğ al-ğurh ba'da dālika bi-l-fital wa-l-marāhim* / "and then treat the wound with dressings and ointments" (id. 707.68=706.5); *tumma tu'āliğuhū bi-anwā' al-ilāğ alladī yanbağī hattā yabra'u* / "then treat as necessary until cured" (id. 711.115=710.22); *tumma tu'āliğ al-al il bi-ilāğ aš-šawša min al-ğadā' wa-d-dawā'* / "then treat the patient with diet and medicines as for pleurisy" (id. 731.19-733.20=730.22f); *wa-āliğ al-al il bi-mā yusakkin al-waram min dāhil aydan* / "and treat the patient with internal remedies against abscess, too" (id. 733.26f=732.7f); *al-ilāğ al-ħāss* / "special treatment" (id. 823.31=822.15). 'Ilāğ and its other forms often occur together with *adwiya* referring to one of the three constituent parts of medicine, i. e. treatment with medicaments or treatment by medical means, the other two being treatment by diet and surgery. *Amal*, *ilāğ* and *šinā'a* may appear by themselves, too, especially when the exact meaning or reference is clear from the context.

If we now turn to the word *ħadīd*, first of all we can state that it occurs in our text very often: normally in this form (61 times) but also as *ħadīda* (11 times). It is often used to have the meaning of *iron*, e. g. *miğrafat ħadīd* / "iron ladle" (id. 67.5=66.6); *unbūbat ħadīd* / "tube of iron" (id. 67.11f=66.12); *unbūba min nuħāš aw ħadīd* / "a cannula made of bronze or iron" (id. 157.11f=156.14); *yušna' qarwshū l-a'lā wa-šafratuhū min ħadīd* / "the upper bow and the blade are made of iron" (id. 571.141=570.2f); *aw šubh al-ħağar ka-l-ħadīd wa-z-zuğāğ* / "or what resembles stone, such as iron or glass" (id. 191.2f=190.2f). The word *ħadīd* also appears frequently where the translation suggests the

³⁶ id. 389.9=388.10f. (The English translations of the examples here and below are those by Spink and Lewis.)

meaning *knife*, and this indeed corresponds to the context, e. g. *fa-yanbagī an taqṭaʿ bi-l-ḥadīd ḡamīʿ al-fadla* / “you must excise all the superfluous growth” [with a knife] (*id.* 591.8=590.11); *wa-ammā ʿilāḡubā bi-l-ḥadīd fa-yakūn ʿalā ɗarbayn aḥaduhumā an yuṣaqq wa-yuḥraḡ ad-dam al-aswad wa-l-waḡh al-āḥar an yusall al-ʿirq wa-yuḥraḡ bi-asriḥi* / “the treatment with the knife is of two kinds: one is to incise and bring out all the black blood, the other is to draw out the vein and extract it bodily” (*id.* 595.5ff=594.6ff); *fa-yanbagī an taḡtanib ʿilāḡahā bi-l-ḥadīd* / “you must avoid treatment by the knife” [in the case of an aneurysm] (*id.* 369.10f=368.12); *fa-lā yanbagī an yutaʿarrad bi-l-ḥadīd* / “should certainly not be tackled with the knife” [on tumours arising from the twist of a tendon] (*id.* 373.9=372.9f). In other contexts the equivalent of *ḥadīd* will be some iron instrument other than a knife: *tumma staʿmil al-fital al-malṭūta fī l-adwiya al-ḥadda wa-dussihā ilā qaʿr an-nāsūr alladī tudrikuḥū bi-l-ḥadīd* / “then use swabs soaked in corrosive, and push them to the bottom of the fistula, which is as far as you can reach with the probe” (*id.* 557.45ff=556.8ff); *wa-kāna saḥman kabīran min siḥām al-qusīy al-murakkaba murabbaʿ al-ḥadīd* / “but it was a big arrow from a compound bow, the iron tip four-sided” (*id.* 613.44f=612.7f); *fī ḡard al-asnān bi-l-ḥadīd* / “on scraping the teeth with an iron instrument” (*id.* 273.1=272.1). There are also some instructive cases in the description of cauterization. Az-Zahrāwī uses *ḥadīd* when speaking about the basic material of the cautery or the metal applied in cauterization, e. g. *al-kayy bi-d-ḡahab afdal min al-kayy bi-l-ḥadīd* / “cauterization by gold is more effective than by iron” (*id.* 15.53=14.1f); *wa-l-kayy biḥi aḥsan wa-afdal min al-ḥadīd* / “cauterization by gold is indeed better and more successful than with iron” (*id.* 15.56=14.6f). But when speaking about the cautery itself, az-Zahrāwī always uses (apart from *mikwāt*) *ḥadīda* (pl. *ḥadāʿid*); never *ḥadīd*: *ḥadāʿid al-kayy* / “cauterizing irons” (*id.* 3.8=2.12), “iron cauteries” (*id.* 7.48=6.19); *al-ḥadīda* / “it” (= *mikwāt* / “cautery”) (*id.* 25.18=24.5), “iron” (*id.* 63.5=62.8); *al-ḥadīda al-maḥmīya* / “hot iron” (*id.* 67.9=66.11); *ḥadīda maḥmīya bi-n-nār* / “red-hot iron” (this may or may not be a cautery: in this case it is not cauterization that is meant but the removal of a leech sticking in the throat of a

patient) (*id.* 317.7=316.9); *wa-yanbagī an takūn al-makāwī min al-kubr wa-s-šigar ‘alā ḥasab al-a‘dā’ wa-l-mafāsīl ‘alā mā taqaddama min šifāt al-ḥadā'id* / “the cauteries should be of the types of instrument mentioned earlier, larger or smaller in proportion to the size of the limb or joint” (*id.* 145.22ff=144.8ff). *Ḥadīda* is also used of iron instruments other than knives, e. g. a drill: *wa-hurwa an ta'ḥud miš'aban min ḥadīd al-fūlād (...)* *tumma tudḥil ḥadīdat al-miš'ab fī l-iḥlīl bi-rifq* / “you take a drill of the finest steel (...) then introduce the iron of the drill gently into the meatus” (*id.* 417.61-64=416.8-12); *yakūn ṭaraf al-ḥadīda mutallaṭan* / “its extremity, which is of iron, should be triangular” [speaking of a drill / *miš'ab*] (*id.* 245.17=244.2). In the case of cauteries *ḥadīd* cannot refer to a knife because cauteries do not normally have the shape of a knife; when *az-Zahrāwī* means a knife-shaped or bladed cautery, he uses compounds with the word *sikkīn*, e. g. *mikwāt ṣaġīra sikkīnīya* / “a small edged cautery” (*id.* 61.4=60.5); *bi-l-mikwāt dāt as-sikkīnayn* / “with the cautery of two blades” (*id.* 27.16=26.20f); *wa-ḥādīhī šūrat al-mikwāt wa-ḥīya nawf min as-sikkīnīya* / [this is] “the shape of the cautery. It is a variety of the bladed cautery” (*id.* 31.11=30.14f); *mikwāt sikkīnīya laṭīfa* / “a knife-edged cautery” (*id.* 429.51=428.14).

It is instructive to learn that the majority of Arabic dictionaries know of *ḥadīd* meaning *iron* as a general term³⁷; this word, then, can be applied to denote various instruments made of iron along the lines indicated by Lane: “*istahadda* (...) He shaved his pubes with [a razor of] iron: derived from *ḥadīd*”³⁸. On the same level there is the alternatively structured expression *ḥadīd al-quyūd*, where the range of meaning of the two constituent parts is more or less coextensive: the

³⁷ See Lane 1863-1893:526a-b; *az-Zabīdī*, *Tağ* II, 335; *aš-Šartūnī* 1889 I, 171a; *al-Ġawharī*, *Šiḥāḥ* 463; *al-Azharī*, *Tahdīb* III, 420b; *al-Bustānī* 1977:154b; *Ibn Manzūr*, *Lisān* 800a-b; *Reig* 1983, No. 1193; *al-Fīrūzābādī*, *Qāmūs* I, 286.

³⁸ Lane 1863-1893:525a (No. 10). Cf. also *az-Zabīdī*, *Tağ* II, 335.8ff; *aš-Šartūnī* 1889 I, 170c9f; *al-Bustānī* 1977:153c33ff; *Ibn Manzūr*, *Lisān* 800b12; *Brünnow - Fischer* 1984:25a, 23-27 (glossary); *al-Fīrūzābādī*, *Qāmūs* I, 286.21.

whole of the fetters consists of iron³⁹. Similar to this is the Syrian Arabic expression *ḥadīd šibbāk* / “Fenster-Eisen”: Das grobe eiserne Gitter draussen [ein bisschen weit] vor den Fenstern oder Kellerlöchern heisst in Syr. einfach *ḥadīd šibbāk* ‘Fenster-Eisen’” (Almqvist 1925:2). Here the range of meaning of the two constituent parts is not coextensive: *ḥadīd* constitutes merely one part of *šibbāk*. This second stage in the development of the meaning of the word *ḥadīd*, where *ḥadīd*, the general name of a well-known material, is used to denote an instrument made thereof, is characterized by the eventual interchange of the forms *ḥadīd* and *ḥadīda*⁴⁰, the latter defined as “a piece of iron” by most dictionaries⁴¹.

Most occurrences of *‘ilāğ al-ḥadīd* can thus be interpreted as *treatment with iron*, which is represented in our cases by an iron instrument and which in these particular instances happens to be a knife. There are, however, two closely related occurrences that do not lend themselves to such an interpretation. In the chapter on the treatment of femoral hernia we read: *wa-‘ilāğuhū bi-l-kayy ka-mā qaddamtū wasfabū wa-qad yu‘ālāğ bi-l-ḥadīd ‘alā ḥādihī ṣ-ṣifa (...)* / “it should be treated by cauterization as I have already described. Sometimes also it is treated with the knife in this manner (...)” (az-Zahrāwī, *Surgery* 449.7f=448.10f). There follows the description of the treatment after which az-Zahrāwī arrives at the conclusion: *wa-l-kayy ağwad fī ḥādā l-marwđi* / “but the cautery is better at this spot” (*id.* 449.17=448.23). Now, az-Zahrāwī makes it clear at the beginning of his work that contrary to the opinion of the Ancients, who preferred

³⁹ See az-Zabīdī, *Tāğ* II, 335.5; al-Ġawharī, *Šiḥāḥ* 462b; al-Bustānī 1977:154b1; Ibn Manẓūr, *Lisān* 801b7f.

⁴⁰ See Ibn Manẓūr, *Lisān* 800b12 and *ibid.* c33 *ḥadīd* against *ibid.* c37 *ḥadīda*. Similarly az-Zabīdī, *Tāğ* II, 335.8-10. Cf. also Brünnow – Fischer 1984:25a (glossary) against *ibid.* 23-25 (glossary).

⁴¹ See Lane 1863-1893:526b; al-Bustānī 1977:154b12f.; Ibn Manẓūr, *Lisān* 800a-2(=37). This use of the feminine ending belongs to the basic tenets of Arabic grammar. See, e. g., Grande 1963:112(No. 3g); Fischer 1972:49(# 84a).

cauteries of gold, he himself always uses iron cauteries. He also regards cauterization as an integral part of surgery – the *bāb* / “chapter” on cauterization covers about one fifth of the whole work –, consequently this contrast between *‘ilāğ al-ḥadīd* and *kayy* makes sense only if *ḥadīd* does not refer to the cautery here, although it is an iron instrument. What we have here before us, then, is already a certain degree of lexicalization, and since the detailed description of the operation leaves no doubt as to its nature (*tumma taṣuqq* / “make an incision” [*id.* 449.8f=448.11]; *tumma tabutt* / “then perforate” [*id.* 449.9f=448.13]; etc.), we have consequently to state that *ḥadīd* here can only mean *knife*, to the exclusion of other iron instruments⁴². This degree of lexicalization or further specialization in the meaning of *ḥadīd* seems to be attested by Dozy, Redhouse, Schmidt – Kahle and Steingass⁴³.

If we now return to our previous question, we can state unanimously that *al-‘ilāğ bi-l-yad* and *al-‘ilāğ bi-l-ḥadīd* do not seem to be wholly interchangeable synonyms: *al-‘ilāğ bi-l-yad* is a wider term, which includes *al-‘ilāğ bi-l-ḥadīd*; there are, however, manual operations that are performed without the help of a knife or of iron instruments in general e. g. bone-setting. This is nowhere explicitly stated either in *az-Zahrāwī* or in the Arabic translations of Galen extant and accessible to me⁴⁴, but all occurrences of these expressions seem to conform to this rule. It may be significant in this respect that although *al-‘ilāğ bi-l-ḥadīd* occurs in *az-Zahrāwī* more often than *al-‘ilāğ bi-l-yad* (see above),

⁴² If for some reason – contrary to what we have just undertaken – we are not allowed to analyze the compound *‘ilāğ al-yad* into its components, then we have to conclude that the whole compound as a unit in itself must mean *cutting, perforating, making incisions etc.*, in one word it must denote the activities performed by a knife. We omit this possibility from consideration.

⁴³ See. Dozy 1927 I, 255b; Schmidt – Kahle 1918-1930 II, 34.18 (cited in Denizeau 1960:101). In view of the lack of exact quotations, further investigations are needed to clarify whether the English equivalents as given by Redhouse and Steingass are to be regarded as representatives of the second or third degree in the development of the meaning of *ḥadīd* as sketched above. See Steingass 1892:413b; Redhouse 1921:772a.

⁴⁴ See footnotes nos. 4 and 5 above.

the title of the whole work (*maqāla*) on surgery is *ğuz' al-ʿamal bi-l-yad* and not *bi-l-ḥadīd*, the three books (*abwāb*) on the three constituent parts of surgery being 1) *fī l-kayy* / “on cauterization” (az-Zahrāwī, *Surgery* 9.1=8.2); 2) *fī š-šaqq wa-l-batt wa-l-faṣd wa-l-ğirāḥāt wa-naḥwihā* / “on incision, perforation, venesection and wounds and the like” (*id.* 167.1=166.2ff); 3) *fī l-ğabr* / “on bone-setting” (*id.* 677.1=676.2). This last book on bone-setting covers an area where a number of operations are performed without iron instruments in general and without a knife in particular.

The statement concerning the relationship between *al-ʿamal bi-l-ḥadīd* and *al-ʿamal bi-l-yad* throws into relief one particular facet of the expressions *al-ʿilāğ bi-l-ḥadīd bi-l-yad* and *ʿilāğ al-ḥadīd bi-l-yad*, namely that they belong to the type that might conveniently be termed *redundant hendiadys* in so far as the field of meaning of the one component part (*al-ʿilāğ bi-l-yad*) completely includes that of the other (*al-ʿilāğ bi-l-ḥadīd*). This forms a contrast to the regular type of hendiadys in Arabic, where the fields of meaning of the two constituent parts partly overlap (Beeston 1970:112).

In the present paper we hope to have shown convincingly that

1) the expressions *al-ʿilāğ bi-l-ḥadīd bi-l-yad* and *ʿilāğ al-ḥadīd bi-l-yad* respectively, are to be regarded as examples of hendiadys characteristic of Ḥubayš;

2) although *ḥadīd* originally has the meaning of iron in the relevant expressions, at least by the time of az-Zahrāwī by way of lexicalization and specialization *al-ʿilāğ bi-l-ḥadīd* has come to denote *treatment by the knife* to the exclusion of other iron instruments;

3) *al-ʿilāğ bi-l-yad* is wider in meaning, wholly encompassing *al-ʿilāğ bi-l-ḥadīd*;

4) in our texts these terms do not seem yet to have reached the status of fully established technical terms in the modern sense of the word.

REFERENCES

A. Primary sources

- al-Azharī, *Tahdīb* = Abū Mansūr Muḥammad b. Aḥmad al-Azharī, *Tahdīb al-luġa*. Edited by ʿAbd al-Ḥalīm an-Naġġār, Muḥammad ʿAlī an-Naġġār. Cairo 1964-1967.
- al-Fīrūzābādī, *al-Qāmūs* = Abū ṭ-Ṭāhir Muḥammad b. Yaʿqūb al-Fīrūzābādī, *al-Qāmūs al-muḥīt*. Cairo n.d.
- Galen, *Anat. adm.*, ed. Garofalo = Galenus, *Anatomicarum administrationum libri qui supersunt novem earundem interpretatio arabica Hunaini Isaaci filio ascripta*. Tomus prior libros I - IV continens. Edited by Ivan Garofalo. Naples 1986.
- Galen, *Anat. adm.*, MS Brit. Mus. = Ğālīnūs, *Kitāb ʿilāġ at-taʿrīḥ*, MS British Museum Add. 23.406 (British Library, London)
- Galen, *Anatomie* = *Sieben Bücher Anatomie des Galen*. Hrsg. u. übers. v. Max Simon. Leipzig 1906.
- Galen, *Examinations* = Galen, *On examinations by which the best physicians are recognized*. Ed. and transl. by Albert Z. Iskandar. *Corpus Medicorum Graecorum, Supplementum Orientale IV*. Berlin 1988.
- Galen, *Firaq* = *Kitāb Ğālīnūs fī firaq at-ṭibb li-l-mutaʿallim īn*. Edited by Muḥammad Salīm Sālīm. Cairo 1977.
- Galen, *Galawqan* = *Kitāb Ğālīnūs ilā Galawqan fī t-taʿattī li-šifāʾ al-amrād. Maqālatān*. Šarḥ wa-talḥīṣ Hunayn b. Ishāq al-mutaṭabbib. Edited by Muḥammad Salīm Sālīm. Cairo 1982.
- Galen, *Glauc.*, MS Paris = *Kitāb Ğālīnūs ilā Galawqan fī t-taʿattī li-šifāʾ al-amrād*, MS arabe 2860 (Bibliothèque Nationale, Paris). Cited in Galen, *Galawqan*, 505.
- Galen, *Glauc.*, MS Teheran = *Kitāb Ğālīnūs ilā Galawqan fī t-taʿattī li-šifāʾ al-amrād*, MS 521 (Kitābhāna-i Maġlis-i Šūrā-yi Millī, Teheran). Cited in Galen, *Galawqan*, 505.
- Galen, *Hipp. victu* = Galenus, *In Hippocratis De natura hominis, In Hippocratis De victu acutorum, De diaeta Hippocratis in morbis*

- acutis*. Edited by I. Mewaldt, G. Helmreich, I. Westenberger. *Corpus Medicorum Graecorum V*, 9, 1. Leipzig – Berlin 1914.
- Galen, *Loc. aff.*, MS Wellcome = *Ġālīnūs, Kitāb fī l-ʿdāʿ al-ālīma*, MS Or. 14a (Wellcome Institute for the History of Medicine, London)
- Galen, *Meth. med.*, MS Paris = *Kitāb Ġālīnūs fī ḥīlat al-burʿ*, MS arabe 2855 (Bibliothèque Nationale, Paris) (contains Books I – V)
- Galen, *Off. med.* = Galenus, *In Hippocratis De officina medici commentariorum versio arabica, quoad exstat*. Edited and translated by Malcolm Lyons. *Corpus Medicorum Graecorum, Supplementum Orientale I*. Berlin 1963.
- Galen, *Opera* = Claudius Galenus, *Opera omnia*. Edited by Carolus Gottlob Kühn. Leipzig 1821 – 1833.
- Galen, *Scr. min. III* = Claudius Galenus, *Scripta minora*. Vol. III. Edited by G. Helmreich. Leipzig 1893.
- Galen, *Sympt. caus.*, MS Paris = *Kitāb Ġālīnūs fī l-ʿilal wa-l-ʿrād*, MS arabe 2859 (Bibliothèque Nationale, Paris)
- Galen, *De usu partium*, ed. Helmreich = Galenus, *De usu partium libri XVII*. Edited by Georgius Helmreich. Leipzig 1907 – 1909.
- Galen, *De usu partium*, MS Paris = *Kitāb Ġālīnūs fī manāfiʿ al-ʿdāʿ*, MS arabe 2853 (Bibliothèque Nationale, Paris)
- Galen, *Ven. art. diss.*, MS Berlin = *Kitāb Ġālīnūs fī tašrīḥ ʿurūq aḍ-ḍawārib wa-ḡayr aḍ-ḍawārib*, MS ar. 6233 (Staatsbibliothek Preussischer Kulturbesitz, Berlin-West)
- al-Ġawharī, *aṣ-Ṣiḥāḥ* = Ismāʿil b. Ḥammād al-Ġawharī, *aṣ-Ṣiḥāḥ*. Edited by Aḥmad ʿAbd al-Ġafūr ʿAṭṭār. Cairo 1376.
- Ḥunayn, *Übersetzungen* = Ḥunain b. Ishāq, *Über die syrischen und arabischen Galen-Übersetzungen*. Edited and translated by Gotthelf Bergsträsser. *Abhandlungen für die Kunde des Morgenlandes XVII*, 2. Leipzig 1925.
- Ibn Manzūr, *Lisān* = Muḥammad b. Mukarram Ibn Manzūr, *Lisān al-ʿarab*. Cairo 1979.
- az-Zabīdī, *Tāğ* = Muḥammad Murtaḍā az-Zabīdī, *Tāğ al-ʿarūs min ḡawāhir al-qāmūs*. Cairo 1306 – 1307.

- az-Zahrāwī, *Presentation* = Abū'l-Qāsim az-Zahrāwī, *A presentation to would-be authors on medicine. Publications of the Institute for the History of Arabic-Islamic Science*. Edited by Fuat Sezgin. Series C. *Facsimile Editions*. Vols 31,1-2. Frankfurt 1986.
- az-Zahrāwī, *Surgery* = Albucasis, *On surgery and instruments*. Edited and translated by M. S. Spink and G. L. Lewis. London 1973.
- az-Zahrāwī, *Traktat* = Abū-l-Kāsim Ḥalaf b. 'Abbās az-Zahrāwī, *Traktat o hirurgii i instrumentah*. Edited and translated by Z. M. Bunyatov. *Pamyatniki pis'mennosti vostoka LIII*. Moscow 1983.

B. Secondary sources

- Almkvist, Herman. 1925. "Kleine Beiträge zur Lexikographie des Vulgärarabischen II". Edited by K. V. Zetterstéen. *Le Monde Oriental* 19.
- Beeston, A. F. L. 1970. *The Arabic Language Today*. London.
- Bergsträsser, Gotthelf. 1913. *Ḥunain ibn Ishāq und seine Schule*. Leiden.
- Brünnow, Rudolf-Ernst & August Fischer. *Arabische Chrestomathie aus Prosaschriftstellern*. 6th edition. *Porta Linguarum Orientalium, N.S. XVI*. Wiesbaden 1984.
- al-Bustānī, Buṭrus. 1977. *Muḥīt al-muḥīt*. Beirut.
- Denizeau, Claude. 1960. *Dictionnaire des parlers arabes de Syrie, Liban et Palestine*. Paris.
- Dozy, R. 1927. *Supplément aux dictionnaires arabes*. 2. edition. Leiden & Paris.
- Fischer, Wolfdietrich. 1972. *Grammatik des klassischen Arabisch*. *Porta Linguarum Orientalium, N. S. XI*. Wiesbaden.
- Grande, Bentsion Meyerovič. 1963. *Kurs arabskoy grammatiki v sravnitel'no-istoričeskom osveščanii*. Moscow.
- Lane, Edward William. 1863-93. *An Arabic-English Lexicon*. London.
- Liddell, Henry-George & Robert Scott. 1985. *A Greek-English Lexicon*. 9th edition. With a Supplement. Oxford.
- Onions, C. T., ed. 1982. *The Oxford Dictionary of English Etymology*. Oxford.

- Ormos, István. 1993. "Bemerkungen zur editorischen Bearbeitung der Galenschrift 'Über die Sektion toter Lebewesen'". *Galen und das hellenistische Erbe. Verhandlungen des IV. Internationalen Galen-Symposiums Berlin 1989* edited by Jutta Kollesch, Diethard Nickel. *Sudhoffs Archiv. Beiheft 32*. Stuttgart 1993.165-172.
- Redhouse, James W. 1921. *A Turkish and English Lexicon*. Constantinople.
- Reig, Daniel. 1983. *Dictionnaire arabe-français français-arabe. as-Sabil. Collection Saturne*. Paris.
- aš-Šartūnī, Saʿīd. 1889. *Aqrab al-mawārid fī fuṣaḥ al-ʿarabīya wa-š-šawārid*. Beirut.
- Savage-Smith, Emilie. 1976. "Some sources and procedures for editing a medieval Arabic surgical tract". *History of Science* 14.245-264.
- Schmidt, Hans & Paul Kahle. 1918-30. *Volkserzählungen aus Palästina I-II*. Göttingen. Cited in Denizeau 1960.
- Sezgin, Fuat. 1970. *Geschichte des arabischen Schrifttums. Band III*. Leiden.
- Steingass, F. 1892. *A Comprehensive Persian-English Dictionary*. London.
- Ullmann, Manfred. 1970. *Die Medizin im Islam. Handbuch der Orientalistik. Abt. I, Ergänzungsband VI, 1*. Leiden & Köln.
- Webster. 1958. *Webster's New World Dictionary of the American Language*. College Edition. Cleveland & New York.