

ʔibn Sīnā's Risālah:
ʔasbāb huduwθ ʔal-huruwf
Version 2

A Treatise on Phonetics: Translation & Notes ¹

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(P. 101)² The master sheik said: Not every one who accepts a gift or requests something is lacking that thing. Rather it could be that the rich accepts from the poor with the purpose of honoring the poor and the great delight the small. The teacher ʔabu Mansūwr Muḥammad ʔibn ʔaliy ʔibn ʔumar ʔal-ʔabbān, asked me, a request of appreciation not of deprivation, that I write down what has accumulated with me, in an abbreviated treatise, of what I know about the *huduwθ* 'occurrence' of the *huruwf* 'letters', and their variations in what is heard. I met *marsuwmahu* 'his decree' with compliance. From the Exalted God is the success granted in pursuit of what is right and following in its tracks.

I divided the treatise into six sections:

- On the *huduwθ* 'occurrence' of *sʔawt* 'sound',
- On the *sabab* 'cause' of the *huruwf* 'letters',
- On the *tašriyh* 'dissection' of the *ḥandẓarah* 'larynx' and the *lisān* 'tongue',
- (p.102) On *ʔasbāb* 'causes' of each *ḥarf* 'letter' of the *huruwf* 'letters' of the Arabs,
- On the *huruwf* 'letters' that are *šabiyhah* 'similar' to these *huruwf* 'letters',
- On the fact that these *huruwf* 'letters' may be heard in other than *ḥarakāt nutʔiqyyah* 'articulatory motions'.

رسالة أسباب حدوث الحروف
الرواية الثانية

بسم الله الرحمن الرحيم
رسالة عن أبي علي بن سينا في مخارج
الحروف

(ص. ١٠١) قال الشيخ الرئيس: ما كل من تقبل هدية أو طلب شيئاً يكون عادماً لذلك الشيء. فقد يقبل الغني من الفقير غرضاً لإكرام الفقير، ويبسط الكبير الصغير. والأستاذ أبو منصور محمد بن علي بن عمر الجبان طلب مني طلب مباسطة لا طلب افتقار أن أكتب الحاصل عندي من معرفة حدوث الحروف باختلافها في المسموع في رسالة موجزة، فقابلت مرسومه بالامتثال، ومن الله تعالى التوفيق في تتبع الصواب واقتناء أثره.

وقسمت الرسالة إلى ستة فصول:

- أ. في حدوث الصوت.
- ب. في سبب الحروف.
- ج. في تشريح الحنجرة واللسان.
- (ص. ١٠٢) د. في أسباب حرف حرف من حروف العرب.
- هـ. في حروف شبيهة بهذه الحروف.
- و. في أن هذه الحروف قد تُسمع من حركات غير نُطقيّة.

¹The author thanks Professor Mohammad Alhawary for reading the entire treatise and making comments and suggestion on the style, the translations and the notes.

²This translation is based on the edition of ʔal-tʔayyān, Mohammad H. and Yahya M. ʔalam, 1983 (Damascus: Madẓmaʔ ʔal-luḡah ʔal-ʔarabiyyah) with their kind permission. This is the beginning of the Arabic text of the second version of the treatise of ʔibn Sīnā on phonetics.

The First Section-2

On the *sabab* ‘Cause’ of the *hduwθ* ‘Occurrence’ of *ʔal-sʿawt* ‘the sound’

(P.103) My estimation is that *ʔal-sabab ʔal-qariyb* ‘the proximate cause’ of the sound is the sudden *tamawwudʒ* ‘wave setting’ of the *hawāʔ* ‘air’ with *surʕah* ‘speed’ and *quwwah* ‘power’ from any *sabab* ‘cause’ whatsoever. As to conditioning of the matter of *qarʕ* ‘striking’ in it, it is possible that it may not be that it is *sababan kulliyān* ‘a total cause’ for the sound. Rather, it is like being *ʔakθariyyān* ‘a majority’ cause. And if it were *sababan kulliyān* ‘a total cause’, then it is *sababun baʕiydun* ‘a remote cause’, not *mulāsʿiq* ‘contiguous’ to the *wudʒuwd* ‘existence’ of sound.

The proof for this is that the sound occurs from the opposite of the *qarʕ* ‘striking’ and that is *qalʕ* ‘plucking’, because the *qarʕ* ‘striking’ is the proximity of *dʒirm* ‘an object’ to another *dʒirm* ‘object’ opposed to it in *qurb* ‘closeness’, next to and succeeding it with *ʕaniyyah* ‘a violent’ contact, with the *surʕah* ‘speed’ of the motion of *taqriyb* ‘approximating’ and *quwwatihi* ‘its power’. *muqābilu* ‘parallel to this’ is *buʕd* ‘distance’ of *dʒirm* ‘an object’ from another *dʒirm* ‘object’ that is in contact with it, one flush against the other, that separates from *mamāsatihi* ‘its contact’ with the *quwwah* ‘power’ and the *surʕah* ‘speed’ of the *ḥarakah* ‘motion’ of the *tabʕiyd* ‘distancing’. Hence, here a *sʿawt* ‘sound’ appears without the existence of *qarʕ* ‘striking’.

As for the *tamawwudʒ* ‘wave setting’ of the *hawāʔ* ‘air’, with *surʕah* ‘speed’ and *quwwah* ‘power’, it is necessary for both of them. But in the *qarʕ* ‘striking’, (p.104) it is necessary in that the air *mundʿayitʕ* ‘becomes compressed’ by the *qāriʕ* ‘striker’ and is found free from that *masāfah* ‘distance’ which the *qāriʕ* ‘striker’ traverses with *quwwah* ‘power’ and *surʕah* ‘speed’. But in the *qalʕ* ‘plucking’, the *qāliʕ* ‘pluckers’ is necessitated in that the air that *yadfaʕuhu* ‘pushes it’ from the *makān* ‘place’ that is emptied off of the *qāliʕ* ‘pluckers’. In both of them, it is necessary to direct *ʔal-baʕiyd* ‘the distant’ air towards the *tamawwudʒ* ‘wave setting’ and the *šakl* ‘form’ of the *qāliʕ* ‘pluckers’ in that place. The spread of the *qarʕiyyu* ‘strike-type’ is greater, and in the *qalʕiyyu* ‘pluck-type’ it is less.

الفصل الأول في سبب حدوث الصوت

(ص. ١٠٣) تقديرى أن السبب القريب للصوت تموج الهواء دفعة بسرعة وبقوة من أي سبب كان. وأشترط أمر القرع فيه ممكن ألا يكون سبباً كلياً للصوت، بل سبباً أكثرية، وإن كان سبباً كلياً فهو سبب بعيد، لا ملاصق وجود الصوت.

والدليل على هذا أن الصوت يحصل من مقابل القرع وذلك قلع، لأن القرع هو قرب جرم من جرم مقاوم له قرباً تابعاً له تالياً مماسةً عنيفةً بسرعة حركة التقريب وقوته. ومقابل هذا بعد جرم من جرم مماس له، منطبق أحدهما على الآخر، بعداً يتفرق من مماسته تفرقاً بقوة وسرعة حركة في التباعد، وهاهنا يظهر صوت من غير أن يكون قرع.

وأما تموج الهواء فلازم في كليهما بسرعة وقوة. أمّا في القرع (ص. ١٠٤) فباضطرار أن الهواء إذا صار منضغطاً من القارع، وقد وجد مخلصاً من تلك المسافة التي يجري فيها القارع بقوة وشدة. وأمّا في القلع فباضطرار القالع الهواء الذي يدفعه من المكان الذي يخلو من الهواء من القالع وفي كليهما يلزم انقياد الهواء البعيد للتموج وشكل القالع في ذلك المكان. ويكون الانبساط في القرعي أكثر، وفي القلعي أقل،

Then that *tamawwudʒ* ‘wave setting’ reaches the *sākin* ‘still’ air in the *sʿimāx* ‘auditory meatus’, and to that *ʿasʿab* ‘nerve’ that is spread over its surface.³

Hence, *ʿal-ʿillah ʿal-qariyah* ‘the proximate cause’, by my calculation, is *ʿal-tamawwudʒ* ‘wave setting’; and the *tamawwudʒ* ‘wave setting’ has two causes: *qarʿ* ‘striking’ and *qalʿ* ‘plucking’.

If a claimer were to claim that from the *qalʿ* ‘plucking’ in the air results a *qarʿ* ‘striking’ and is displayed, the weakness of this statement is not the kind that requires its demonstration.

ثم يصل ذلك التموج إلى الهواء الساكن في الصّماخ، وإلى ذلك العصب المفروش في سطحه.

ثم العلة القريبة فيما أحسب هو التموج، وللتموج علتان: القرع والقلع.

وإن ادّعى مدّع أنه يحصل من القلع في الهواء قرع ويظهر، فإنّ ضعف هذا القول ليس مما يتكفّر ببيانه.

³What is to be noted here about such precise anatomical details at that time is the fact that ʿibn Sīnā was a scientist who did the dissection of the organs of speech and hearing. Hence, the inclusion of such precise observations.

The Second Section-2

On the *sabab* ‘cause’ of the occurrence of *ʔal-huruwf* ‘the Letters’

(P.105) As for *ʔal-tamawwudʒ* ‘the wave setting’ itself, it displays the *sʿawt* ‘sound’. As for the *hāl* ‘state’ of *ʔal-tamawwudʒ* ‘the wave setting’ itself, it is from the *ʔittisʿāl* ‘connectedness’ of *ʔadʒzāʔihi* ‘its parts’, *malāsatihi* ‘its smoothness’, and *basʿatihi* ‘its expanse’, and *šiddatihi* ‘its tenseness’ constitute *ʔal-ḥiddah* ‘the sharpness’ and *ʔal-ḥiqal* ‘the heaviness’. *ʔal-ḥiddah* ‘the sharpness’. The former produces it, and *ʔal-ḥiqal* ‘the heaviness’, the latter produces it.⁴ As for *ʔal-tamawwudʒ* ‘the wave setting’, from the direction of the construction which it makes use of on its path of *ʔal-maxāridʒ* ‘the exits’ and *ʔal-mahābis* ‘the places of obstruction’, from it *ʔal-huruwf* ‘the letters’, are displayed.

The *ḥarf* ‘letter’ is *hayʔah* ‘a construct’ for the *sʿawt* ‘sound’ that appears in it. It distinguishes it from another *sʿawt* ‘sound’ that is similar to it in *ḥiddah* ‘sharpness’ and *ḥiqal* ‘heaviness’. If it appears in *masmuwʿ* ‘the thing heard’, it becomes distinguished from others than it.

The letters, some of them are *mufradah* ‘unitary’, and their *ḥuduwθ* ‘occurrence’ is due to *ḥabasāt* ‘individual obstructions’ of the *sʿawt* ‘sound’ or the air, the *fāʿil* ‘activator’⁵ of *sʿawt* ‘sound’. They are followed by the *ʔitʿlāq* ‘release’, suddenly. Some are *murakkab* ‘complex’, and their *ḥuduwθ* ‘occurrence’ (p. 106) is connected to the *ʔitʿlāq* ‘release’, suddenly. Some of them are *murakkab* ‘complex’,⁶ and *ḥabsuhā* ‘their obstruction’ is incomplete but with *ʔitʿlāqāt* ‘individual releases’.

The *mufradah* unitary letters are: *bāʔ* [b], *tāʔ* [t],⁷ *dʒiyim* [dʒ], *dʿād* [dʿ], also after a fashion, *tʿāʔ* [tʿ], *qāf* [q], *kāf* [k], *lām* [l], *miym* [m], and *nuwn* [n], also after a fashion.

⁴*ʔittisʿāl* ‘connectedness’ and *malāsah* ‘smoothness’ produce *ʔal-ḥiddah*, and *basātʿah* ‘expanse’, and *šiddah* ‘tenseness’ produce *ʔal-ḥiqal* ‘the heaviness’.

⁵It is useful to keep in mind that the term *fāʿil* is used in syntax also to indicate the agent, the doer or the subject of the sentence. e.g. *darasa₁ ʔal-waladu₂ ʔal-darsa₃* ‘the-boy₂ studied₁ the-lesson₃’. *ʔal-waladu* is the *fāʿil*.

⁶This last sentence is a redundant repetition.

⁷*dāl* [d], which is found in the first version of the treatise, is missing from this version of the treatise.

الفصلُ الثاني في سببِ حدوثِ الحروفِ

(ص. ١٠٥) أمّا نفسُ التّموجِ فإنّه يُظهرُ الصوتَ، وأمّا حال التّموجِ في نفسه فإنّه من اتصالِ أجزاءه وملاستِهِ وبَسَطَتِهِ وشِدَّتِهِ تكون الحِدَّةُ والنَّقْلُ، والحِدَّةُ يفعلُها الأوّلُ، والنَّقْلُ يفعلُه الثاني. وأمّا التّموجُ من جهةِ الهيئةِ التي يستفيدُها من الخارجِ والمحابسِ في طريقه فمنه تظهرُ الحروفُ.

والحرفُ هيئةٌ للصوتِ تظهرُ فيه، تميّزُهُ من صوتٍ آخرٍ مثله في الحِدَّةِ والنَّقْلِ إذا ظهرَ في المسموعِ تميّزٌ من غيره.

والحروفُ بعضُها مفردةٌ، وحدوثُها من حبساتٍ للصوتِ أو الهواءِ الفاعلِ للصوتِ، يتلوها الإطلاقُ دُفْعَةً. وبعضُها مركّبٌ وحدوثُها (ص. ١٠٦) متّصلٌ الإطلاقِ بدفعه. وبعضُها مركّبٌ، وحبسها ليس تامّاً ولكنّ بالإطلاقاتِ.

الحروفُ المفردةُ: الباءُ، والتاءُ، والجيمُ، والضادُ، أيضاً من وجه، والطاءُ، والقافُ، والكافُ، واللامُ، والميمُ، والنونُ، أيضاً من وجه.

Then the other letters, they are all *murakkabah* ‘complex’.⁸ They occur due to *ʔahbās ʔayr tāmmah* ‘incomplete obstructions’, but only if the *ħabs* ‘obstruction’ is released.

These *mufradah* ‘unitary’ letters, their occurrence is in that separation between the *zamān* ‘time’ of the *ħabs* ‘obstruction’ and the *zamān* ‘time’ of the *ʔitʔlāq* ‘release’. Because the *zamān* ‘time’ of the *ħabs tāmmah* ‘complete obstruction’, the occurrence of a sound out of the air is not possible, while it is *sākin* ‘quiescent’ from the side of the *ħabs* ‘obstruction’. And at the time of the release, nothing is heard of these letters, because there is no *ʔimtitād* ‘lengthening’ in them, except only with the removal of the obstructions.

As for the other *ħuruwf* ‘letters’, they have in common the fact that *tamtadd* ‘they extend’ in *zamān* ‘time’, and *tafnā* ‘they evanesce’ at the time of (p.107) the complete release. *tamtadd* ‘they extend’ during that *zamān* ‘time’ which combines with the *zamān* ‘time’ of the *ʔitʔlāq* ‘release’.

After sharing of each of the *tʔabaqatayn* ‘two layers/levels’ in the general *ʔillah* ‘cause’, they may differ because of the different *ʔadʔrām* ‘objects/bodies’ that are near to them and in which the *ħabs* ‘obstruction’ and *ʔitʔlāq* ‘release’ happen. They may be *ʔalyan* ‘softer’, or they may be *ʔašadd* ‘tighter’, or *ʔaybas* ‘drier’, or *ʔartʔab* ‘more moist’.⁹ Or may be the *ħabs* ‘obstruction’ of the *naʔas* ‘breath’ is in the same *ruʔʔuwbah* ‘moisture’ that *tataqaʔqaʔu* ‘bursts’, then *tatafaqqaʔu* ‘explodes’ either with *ʔittisʔāl* ‘connectedness’ and *ʔimtitād* ‘extension’ or in *makānihā* ‘its place’.

ʔal-ħābisu ‘the obstructor’ may be *ʔasʔyar* ‘smaller’ or *ʔaʔdʔam* ‘grander’, and *ʔal-maħbuws* ‘the obstructed one’ be more or less, and *ʔal-maxradʔ* ‘the exit’ *ʔadʔyaq* ‘narrower’ or *ʔawsaʔ* ‘wider’, *mustadiyr* ‘circular’ in shape, or *mustaʔridʔ* ‘flat’ in shape with precision, and the *ʔal-ħabsu* ‘the obstruction’ is *ʔašadd* ‘tighter’ or *ʔalyan* ‘softer’, and *ʔal-dʔayʔ* ‘the pressure’ after the release *ʔaħfaz* ‘more abrupt’ or *ʔaslas* ‘more fluent’. Explanation for each of these parts, in detail, is forthcoming.

⁸The *murakkabah* ‘complex’ are the balance of the letters: *ʔalif* [ā], *hamzah* [ʔ], *ħāʔ* [h], *ħāʔ* [ħ], *ʔayn* [ʕ], *xāʔ* [x], *ʔayn* [y], *šayn* [š], *ḍāl* [ḍ], *ḍʔ* [ḍʔ], *rāʔ* [r], *zāy* [z], *siyn* [s], *sʔād* [sʔ], *ḥāʔ* [ḥ], *fāʔ* [f], *wāw* [w], *yāʔ* [y].

⁹The feature *ʔasʔlab* ‘more solid’ found in the first treatise is missing from this list.

ثم الحروف الأخرى كلها مركبة، فإنها تظهر من أحباس غير تامة، بل إذا أطلق الحبس.

وهذه الحروف المفردة حدوثها في ذلك الفاصل بين زمان الحبس و زمان الإطلاق، لأن زمان الحبس التام لا يمكن فيه حدوث صوت من الهواء وهو ساكن من جهة الحبس. وفي زمان الإطلاق لا يُسمع شيء من هذه الحروف من أجل أنه لا امتداد فيه إلا مع إزالة الحبس فحسب.

أما الحروف الأخرى فإنها مشتركة في أن تمتد زماناً وتقنى مع زمان (ص. ١٠٧) الإطلاق التام، وتمتد في ذلك الزمان الذي يجتمع مع زمان الإطلاق.

وبعد اشتراك كل واحد من الطبقتين في العلة العامة فقد تختلف بسبب اختلاف أجرام تقرب منها وبها يقع الحبس والإطلاق، فربما كانت ألين، وربما كانت أشد وأيبس وأرطب، وربما كان حبس النفس في ذات رطوبة تتققع ثم تتققأ إما مع انفصال وامتداد، وإما في مكانها.

وقد يكون الحابس أصغر وأعظم، والمحبوس أكثر وأقل، والمخرج أضيق وأوسع ومستدير الشكل ومستعرض الشكل مع الدقة، والحبس أشد وألين، والضغط بعد الإطلاق أحقر وأسلس. وسيأتي البيان لواحدٍ واحدٍ من هذه الأقسام بالتفصيل.

The Third Section-2

On the *tašriyh* ‘dissection’ of *ʔa-handzarah* ‘the larynx’ and *ʔal-lisān* ‘the tongue’,¹⁰

(P. 108) *ʔal-handzarah* ‘the larynx’, it is constructed out of three *ʔadʔariyf* ‘cartilages’. One of them, at the front, is touchable in extremely emaciated persons, near *ʔal-ʔunuq* ‘the neck’ under *ʔal-ḍaqan* ‘the chin. Its shape is the shape of *qasʔah* ‘a bowl’, *ḥadabatuhā* ‘whose concavity’ is from *xāridz* ‘outside’ and *quddām* ‘front’, and *taʔiqiyruhā* ‘whose convexity’ is from *dāxil* ‘inside’ and *xalf* ‘back’. It is called the *daraqiy* ‘shield-like/thyroid’¹¹ and *tursiy* ‘disk-like/thyroid’ *ʔadʔruwf* ‘cartilage’.

A second *ʔadʔruwf* ‘cartilage’ is behind it,¹² *satʔhuhu* ‘its surface’ facing its *satʔhihi* ‘its surface’, is attached to it¹³ by *ribātʔāt* ‘ligaments’ from *yamiyn* ‘right’ and *šamāl* ‘left’. It is separated from it¹⁴ from above. It is called the *ʔadiym ʔal-ʔism* ‘lacking-a-name’.¹⁵

A third cartilage is like a *qusʔayʔah* ‘small bowl’¹⁶ inverted over it. It is separated from *daraqiy* ‘shield-like/thyroid’, attached to *ʔadiym ʔal-ʔism* ‘lacking-a-name/cricoid’ from *warāʔihi* ‘behind it’ by a (p.109) double joint¹⁷ made up of *zāʔidatān* ‘two extensions/processes’ rising from *ʔadiym ʔal-ʔism* ‘lacking-a-name/cricoid’, and gets straightened out in its two *nuqratān* ‘two sockets’, where the *ʔadiym ʔal-ʔism* ‘lacking-a-name/cricoid’ comes close to the *daraqiy* ‘shield-like/thyroid’ and is gathered to it, and due to it, the *dʔiyq* ‘narrowing’ of *ʔal-handzarah* ‘the larynx’ occurs. And if *tabāʔada* ‘it distances itself’ from it, this results is *ʔittisāʔ* ‘enlargement’ of *ʔal-handzarah* ‘the larynx’. From *qurbihī* ‘its proximity’ and *buʔdihī* ‘its remoteness’, *ʔal-sʔawt* ‘the sound’ appears as *ḥādduhu* ‘its sharpness’ and as *ḥaʔiqyluhu* ‘its heaviness’. It gets in construction with *daraqiy* ‘shield-like/thyroid’, like *tʔirdzihāri* ‘an arytenoid’, in *ḥasʔr* ‘trapping’ the *nafas* ‘breath’ and closing *fuwwahatuḥu* ‘its aperture’.

¹⁰Thanks to Dr. Patrick Mahat, M.D., P.C. for looking over the material in this chapter.

¹¹i.e. the thyroid cartilage.

¹²The thyroid cartilage.

¹³The thyroid cartilage.

¹⁴The thyroid cartilage.

¹⁵The cricoid cartilage

¹⁶Arytenoid cartilages.

¹⁷Crico-arytenoid joints.

الفصل الثالث في تشريح الحنجرة واللسان

(ص. ١٠٨) الحنجرة مركبة من ثلاثة غضاريف: أحدهما من قدام ملموس من المهازيل قرب العنق وتحت الدقن، وشكله شكل قسعة تكون حدبها من خارج وقدام، وتغيرها من داخل وخلف، ويسمى الغضروف الدرقي والثرسي.

وغضروف ثان بعده مقابل سطحه لسطحه، متصل به برباطات من يمين وشمال، منفصل عنه من فوق، ويسمى العديم الاسم.

وغضروف ثالث كقصية مكبوبة عليه، وهو منفصل عن الدرقي ومربوط بعديم الاسم من ورائه بمقصيل (ص. ١٠٩) مضاعف تظهر منه زائدتان تلوان من عديم الاسم وتستقيم فيه ثقتان منه، عند اقترابه من عديم الاسم من الدرقي، وينضم إليه، ومنه يكون ضيق الحنجرة، وإذا تباعد عنه يكون منه اتساع الحنجرة. ومن قرنيه وبعده يظهر الصوت حاده وثقيله. ويتركب على الدرقي كطرجهار في حصر النفس وسد فوهته،

If *ʔinqalaʕa* ‘it were to get plucked’ from *ʔal-ḥandzarah* ‘the larynx’, the larynx *ʔittasaʕat* ‘gets enlarged’ by it.

Here there are *ʕadʕalāt* ‘muscles’ that have no names that connect to the *daraqiy* ‘shield-like/thyroid’. And *ʕadʕalāt* ‘muscles’ that *tubāʕidu* ‘distance’ each one of them from the other. And those *ʕadʕalāt* ‘muscles’, if *ʔal-ḥandzarah* ‘the larynx’, *ʔinfataḥat* ‘gets opened’, by distancing (p. 110) the *tʕirdzihri* ‘arytenoid’ from the *daraqiy* ‘shield-like/thyroid’, it opens, inevitably, from above and from the side of the *ʕadiym ʔal-ʔism* ‘lacking-a-name/cricoid’. They connect to the back of the *tʕirdzihāri* ‘arytenoid’, without *tašannudʕ* ‘contracting’, they draw it *xalf* ‘back’, and separate between it and the *daraqiy* ‘shield-like/thyroid’.

There are four muscles created with this *sʕifah* ‘description’. Besides them, there are two that are connected near the *xalf* ‘back’ of the *tʕirdzihāri* ‘arytenoid’, rather, on *yamiynihi* ‘its right’ and on *šamālihi* ‘its left’. Both of them, by means of *tašannudʕ* ‘contraction’, help with opening the *šafah* ‘lip, across its width’; these are six muscles.

The muscles of *ʔitʕbāq* ‘covering’ are necessary. They are connected between the *tʕirdzihāri* ‘arytenoid’ and the *tursiy* ‘shield-like/thyroid’¹⁸ so that their contraction attracts the *tʕirdzihāri* ‘arytenoid’ to the *tursiy* ‘disk-like/ thyroid’. It is known that if they are interior, *ʔintʕibāq* ‘covering’ is even *ʔašadd* ‘tighter’. For this they were created. There are two muscles found in all people. One of them is necessary for the *qurb* ‘approximation’ of the *daraqiy* ‘shield-like/thyroid’ towards the *tʕirdzihāri* ‘arytenoid’ on the right, (p.111) and the other, likewise, on the left.¹⁹ Both of them are small, but by *ʕasʕr* ‘compression’ and the strategic location, they perform a great act to the extent that they oppose the muscles of the *sʕadr* ‘chest’ and the *ḥidzāb* ‘diaphragm’ by the *ḥasʕr* ‘trapping’ of the *nafas* ‘breath’. And in some people, there is another pair similar and auxiliary to them.

As for the *tadʕiyiq* ‘narrowing’ of the *ḥandzarah* ‘larynx’, it is known that in its preferred states, it encloses *mutadʕāmmayn* ‘two closers’, so that, if they *qubidʕa* ‘were held’, their-d closure will appear. In the same way, the muscles of *dʕamm* ‘closure’, of which a pair was created, which proceeds from that bone that is similar to the *lām* [Λ],²⁰ in the writing of the Greeks. It is a triangular bone

وإذا انقلع عن الحنجرة، اتسعت الحنجرة عنه.

ثم هاهنا عضلات لا أسامي لها تتصل بالدرقيّ وعضلات تباعد كل واحد منها عن الآخر. وتلك العضلات إذا انفتحت الحنجرة بإبعاد (ص. ١١٠) الطرّجھاري عن الدرقي لا محالة تفتح من فوق ومن جانب عديم الاسم، وتتصل بمؤخر الطرّجھاري دون أن تشنّج تجذبه إلى خلف، وتفرّق بينه وبين الدرقي.

وأربع عضلات مخلوقة على هذه الصفة، ومن دونها اثنان متصلان بقرب خلف الطرّجھاري بل عن يمينه وشماله، وكلاهما بالشنّج مع المعونة في فتح الشفة في عرضه هذه العضلات الست.

وعضلات الإطباق لأبد منها، تكون متصلة بين الطرّجھاري والثّرسي، حتى تجذب بتشنّجها الطرّجھاري إلى الثّرسي. ومعلوم أنّها إذا كانت داخله كان إطباقها أشدّ، ولهذا خلقت، وعضلتان هما في جميع الناس، إحداهما تلزم قرب عند الدرقي إلى عند الطرّجھاري من اليمين (ص. ١١١) والآخر كذلك من اليسار، وكلاهما صغير يفعل بالعصر وموافقة المكان فعلاً عظيماً إلى حدّ يقاوم به عضل الصدر والحجاب عند حصر النّفس، وفي بعض الناس زوج آخر شبيه به معين له.

وأما تضيق الحنجرة فمعلوم أنّ أفضل حالاته أن يُحيط بمتضامّين حتى إذا فُيَضَ ظهر انضمامهما، وكذلك عضلات الضمّ خلق منه زوج يطلع من ذلك العظم الشبيه باللام في كتابة اليونانيين، وهو عظم مثلث

¹⁸Thyro-arytenoid muscles.

¹⁹Lateral thyro-arytenoid muscles.

²⁰The hyoid bone.

connected to the thyroid *bi-ʿal-ʿard*^f ‘width-wise’, and each one of the *bawāqi* ‘tubas’ extends until it goes beyond the *marīyʿ* ‘esophagus’, from right and left, it reaches the latter and connects to it. And there are four muscles, sometimes they are together and at other times they separate into two pairs of doublets, or two pairs, one of which is *bātʿin* ‘inner’ and the other *dʿāhir* ‘outer’, whichever is the case, they reach the *daraqiy* ‘shield-like/thyroid’, then lean after that towards the *ʿadiym ʿal-ʿism* ‘lacking-a-name/cricoid’.

As for the *tawassuʿ* ‘widening’ of the larynx, it is known that it can do without *taʿdʿiyimihi* ‘its enlargement’, nor is it in need of it,²¹ because the muscles of the *sʿadr* ‘chest’ and the *hidzāb* ‘diaphragm’ expel the *nafas* ‘breath’ to outside *bi-quwwah* ‘with power’. That could be, if it were limited to it, sufficient for opening the *handzarah* ‘larynx’.

(P.112) Among the *ʿadʿal* ‘muscles’ of *fath* ‘opening’, there is a pair of muscles that comes from the bone²² that is similar to *lām* [ل], and it reaches to the full front of the *daraqiy* ‘shield-like/thyroid’. If it were to contract, it would pull it upwards and forward, and free it from contacting the *ʿadiym ʿal-ʿism* ‘lacking-a-name/cricoid’.

Among those, there is a shared pair between the *handzarah* ‘larynx’ and the *hulquwm* ‘throat’. It rises from the *qasʿsʿ* ‘sternum’, goes beyond the *daraqiy* ‘shield-like/thyroid’ and proceeds towards the rear of the *lā ʿisma lahu* ‘lacking-a-name/cricoid’ and the front of the *hulquwm* ‘throat’. If it were to contract, it would pull the throat downwards, and the *lā ʿisma lahu* ‘lacking-a-name/cricoid’ backwards. It separates between it and the *daraqiy* ‘shield-like/thyroid’. It may be that another pair, similar to it, aids it in some individuals but that is rare. It is found in individuals with large larynges, but in big animals, always.²³

As for the *lisān* ‘tongue’, after verification, eight muscles set it in motion. Two of the muscles²⁴ come from the *zawāʿid ʿal-sahmiyyah* ‘arrow appendices/styloid processes’ that are near the ears both from the right and the left, and reach the two sides of the *lisān* ‘tongue’, so that if *taʿannadzatā* ‘they-d were to contract’ *ʿarradʿatā* ‘they-d would widen it’.

ومتصل بالدرقي بالعرض، ويمر كل واحد من البواقي حتى يجاوز المريء من يمين ومن شمال، ويصل إلى الأخير ويتصل به. وأربع عضلات تجتمع حيناً وتفترق حيناً في زوج مضاعف أو زوجين، أحدهما باطن والآخر ظاهر، وكيفما كان فإنها تتصل بالدرقي ثم تميل بعد ذلك إلى العديم الاسم.

وأما توسع الحنجرة فمعلوم أنه مستغن عن تعظيمه، غير مفتقر إليه، فإن عضل الصدر والحجاب تحفز النفس إلى خارج بقوة، فيكون ذلك لو اقتصر عليه كافياً في فتح الحنجرة.

(ص. ١١٢) فمن عضل الفتح زوج عضلة يأتي من العظم الشبيه باللام، ويتصل بمقدم الدرقي كله. فإذا تشنج جذبته إلى فوق وإلى فدام، فبرأه عن ملاصقة الذي لا اسم له.

ومن ذلك زوج مشترك بين الحنجرة والحلقوم يصعد من القص ويجاوز الدرقي، ويستمر إلى مؤخر الذي لا اسم له ومقدم الحلقوم، فإذا تشنج جذب الحلقوم إلى أسفل، والذي لا اسم له إلى خلف، فيفرق بينه وبين الدرقي، وربما عضده في الفرد من الناس زوج آخر شبيه به، وهو نادر، ويوجد في عظيمي الحناجر، وأما في الدواب الكبار فدائماً.

وأما اللسان فتحركه عند التحقيق ثماني عضلات: منها عضلتان تأتيان من الزوائد السهمية التي عند الأذن يميناً ويسرة، وتتصلان بجانب اللسان، فإذا تشنجا عرضناه.

²¹The idea here seems to be that there is no absolute need to mention specific muscles for the purpose of widening the larynx.

²²The hyoid bone.

²³It appears that ʿIbn Sīnā dissected more than one individuals including samples from animals.

²⁴Stylo-glossus muscles.

Among them, two muscles come from the upper part of the bone that is similar to *lām* [ʕ],²⁵ and *tanfuḏān* ‘penetrate-d’ the *wasat* ‘center’ of the *lisān* ‘tongue’. If they were to contract, they would pull the bulk (p.113) of the tongue forward, so that the *dʒirm* ‘object/body’ of the tongue follows them, so that the *lisān* ‘tongue’ *ʔimtadda* ‘extends’ and *tʔāla* ‘lengthens’.

Among them, there are two muscles that come from the two lower branches of the *ʔadʔlāʔ* ‘ribs’ of this bone,²⁶ penetrate in between the *muʔarridʔatayn* ‘two wideners’ and the *mutʔawwilatayn* ‘two lengtheners’,²⁷ and due to them, the *tawriyb* ‘curling’ of the tongue comes about.

Among these, two muscles are situated under these, if they contract *batʔahatā* ‘they-d flattened’ the tongue. As for its inclining upward and inwardly, it is due to the action of the *muʔarridʔah* ‘widening ones’ and the *muwarribah* ‘curling ones’.

ومنها عضلتان تأتيان من أعالي العظم الشبيه باللام ، وتنفذان في وسط اللسان ، فإذا تشنجتا جذبتا جُمَّة (ص. ١١٣) اللسان إلى فُدام فتبعهما جرمُ اللسان ، وامتدَّ و طال .

ومنها عضلتان تأتيان من الضِّلَعين السافلين من أضلاع هذا العظم ، تنفذان بين المعرّضتين والمطولتين ، ويحدثُ عنهما توريبُ اللسان ،

ومنها عضلتان موضوعتان تحتَ هاتين ، إذا تشنجتا بطحتا اللسان . وأما تميله إلى فوق وداخلاً فمن فعل المعرّضة والموربة .

²⁵ The hyoid bone.

²⁶ The hyoid bone.

²⁷ Transversal and longitudinal tongue muscles.

The Fourth Section-2

On ʔa-ʔasbāb ʔal-dʒuzʔiyyah ‘the detailed causes’ for each *ḥarf* ‘letter’ of the letters of the Arabs

[ʔ]: (p.114) As for *ḥamzah* [ʔ], it occurs from a powerful *ḥafz* ‘push’ from the *ḥidzāb* ‘diaphragm’ and the *ʔadʔal* ‘muscles’ of the *sʔadr* ‘chest’ to much air, and from the *ḥāsir* ‘trapper’ of the resistant *tʔirdʒihāriy* ‘arytenoid’²⁸ to the push of the air, for a short time, then pushing it towards *ʔinqilāʔ* ‘release’ by means of the *fātiḥah* ‘opening’ muscles and the air *dʔaytʔ* ‘pressure’, together.

[h]: As for *ḥāʔ* [h], it occurs from a similar *kamm* ‘amount’ and *kayf* ‘how’ of air *ḥafz* ‘push’, except that the *ḥabs* ‘obstruction’ is not *ḥabsan tāmmān* ‘a complete obstruction’ but is caused by the *ḥāffāt* ‘edges’ of the *maxradzā* ‘exit’ while the *sabiyl* ‘passage’ is open, and the displacement contacts its *ḥāffāt* ‘edges’ equally, not leaning except towards the *wasatʔ* ‘center’.

[ʔ]: As for *ʔayn* [ʔ], the *ḥabs* ‘obstruction’ is *ʔayr tāmm* ‘other than complete’, except that it is *qawiyyun* ‘powerful’ and *mundafiʔ* ‘being pushed’ towards the innermost *mawdʔiʔ* ‘location’ in the *ḥalq* ‘throat’ at the *ʔinfitāḥ* ‘opening’ of the *ḥandzarah* ‘larynx’. It is of *ʔalyanuhu* ‘its softer’, *ʔartʔabuhu* ‘its more moist’ and *ʔalʒadzuḥu* ‘its stickier’ *ruʔuwbah* ‘moisture’. The (p.115) *ʔindifāʔ* ‘push’, in it, is straightforward. It *yuqalqilu* ‘agitates’ that *ruʔuwbah* ‘moisture’ and *yuzaʔziʔuhā~* ‘shoves it’ to its sides, equally, without the *ruʔuwbah* ‘moisture’ yielding to *tašaḏʔḏʔiy* ‘fragmentation’ or *tašaḏḏub* ‘discontinuation’ until many *ḥāddah* ‘sharp’ sounds are produced in the *xalal* ‘gap’ of *ʔadʒzāʔihā* ‘its parts’. It commingles with the *naʔmah* ‘tune’ and it *tuxaššinuḥā* ‘roughens it up’ like the *xuʔuwnah* ‘roughness’ that is in *ḥāʔ* [h] and *ʔayn* [ʔ]. And in it, the opening of the *tʔirdʒihāriy* ‘arytenoid’ is complete, and the opening of the *lā ʔisma lahu* ‘lacking-a-name/crocid’ is central.

[h]: As for *ḥāʔ* [h], even though it is a partner with *ʔayn* [ʔ], it differs from *ʔayn* [ʔ] in the configuration of the *maxradzā* ‘exit’, in the *maḥbas* ‘place of obstruction’, in the *quwwah* ‘power’ and in *dʒihah* ‘direction’ of the escape of the air.

²⁸There is a different spelling to this term from what was used in the first version, i.e. *tʔirdʒihāliy*.

الفصل الرابع في الأسباب الجزئية لحرف حرف من حروف العرب

[ع] (ص. ١١٤) أمّا الهَمْزَةُ فَإِنَّهَا تَحْدُثُ مِنْ حَفْزٍ قَوِيٍّ مِنَ الْحِجَابِ وَعَضَلِ الصَّدْرِ لِهَوَاءٍ كَثِيرٍ، وَمِنْ مَقَاوِمَةِ الطَّرْجِهَارِيِّ الْحَاصِرِ زَمَانًا قَلِيلًا لِحَفْزِ الْهَوَاءِ ثُمَّ انْدَفَاعِهِ إِلَى الْانْقِلَاعِ بِالْعَضَلِ الْفَاتِحَةِ وَضَغْطِ الْهَوَاءِ مَعًا.

[هـ] وَأَمَّا الْهَاءُ فَإِنَّهَا تَحْدُثُ عَنْ مِثْلِ ذَلِكَ الْحَفْزِ فِي الْكَمِّ وَالْكِيفِ إِلَّا أَنَّ الْحَبْسَ لَا يَكُونُ حَبْسًا تَامًّا بَلْ تَفْعَلُهُ حَافَاتُ الْمَخْرَجِ وَتَكُونُ السَّبِيلُ مَفْتُوحَةً، وَالْانْدَفَاعُ يَمَاسُ حَافَاتِهِ بِالسَّوَاءِ غَيْرَ مَائِلٍ إِلَّا إِلَى الْوَسْطِ.

[ع] وَأَمَّا الْعَيْنُ فَإِنَّ الْحَبْسَ غَيْرُ تَامٍّ إِلَّا أَنَّهُ قَوِيٌّ وَمُنْدَفَعٌ إِلَى أَدْخَلِ مَوْضِعٍ فِي الْحَلْقِ عِنْدَ انْفِتَاحِ الْحَنْجَرَةِ وَالْأَيْنِ وَأَرْطَبِهِ وَالزَّرْجِ رَطُوبَةً، وَيَكُونُ (ص. ١١٥) الْانْدَفَاعُ فِيهِ مُسْتَقِيمًا، يُقَلِّلُ تِلْكَ الرُّطُوبَةَ وَيُزَعِّزُهَا إِلَى جِهَاتِهَا بِالسَّوَاءِ مِنْ غَيْرِ أَنْ تُذْعِنَ الرُّطُوبَةُ لِلنَّشْطِ وَالتَّشْدُّبِ، حَتَّى يَحْدُثَ مِنْ خَلَلِ أَجْزَائِهَا أَصْوَاتٌ حَادَّةٌ كَثِيرَةٌ، تَخَالِطُ النِّعْمَةَ فَتُخَسِّنُهَا التَّخَشِينَ الَّذِي يَكُونُ فِي الْحَاءِ وَالْعَيْنِ، وَيَكُونُ فِيهَا فَتْحُ الطَّرْجِهَارِيِّ مُطْلَقًا وَفَتْحُ الَّذِي لَا اسْمَ لَهُ وَسَطًا.

[ح] وَأَمَّا الْحَاءُ فَإِنَّهَا وَإِنْ شَارَكَتِ الْعَيْنَ فَإِنَّهَا تَخَالِفُ الْعَيْنَ فِي هَيْئَةِ الْمَخْرَجِ وَفِي الْمَحْبَسِ وَفِي الْقُوَّةِ وَفِي جِهَةِ تَخْلُصِ الْهَوَاءِ،

The *furdzah* ‘slit’ between the lower *yudʿuwfayn* ‘two cartilages’ is *ʔadʿyaq* ‘narrower’ and the air *yandafiʿu* ‘pushes’, leaning more towards the front, and clashes with the *hāffah* ‘rim/edge’ of the *taqʿiyir* ‘hollowing’ which the air of *ʿayn* [ʿ] would clash against at *xuruwdʒ* ‘exiting’. That *hāffah* ‘rim/edge’ is *sʿulbah* ‘solid/stiff’ and the *dafʿ* ‘push’ from it is *ʔašadd* ‘tighter’, so it constrains the *rutʿuwbah* ‘moisture’, inclines it forward, and creates in it a degree of *tašadʿʿiy* ‘fragmentation’ and *tašadʿdub* ‘discontinuation’ that *ʿayn* [ʿ] did not create, and because of that, (p.116) you hear *xušuwnah* ‘roughness’ there produced by *hāddah* ‘sharp’ and *dʿaʿiyfah* ‘weak’ sounds, mixed with the *naʿmah* ‘tune’. The *ʿayn* [ʿ] is in the *mawdʿiʿ* ‘location’ that the air of the *tahawwuʿ* ‘retching’ attains, inner in the *hulquwm* ‘throat’. The *hāʔ* [h] is in the *mawdʿiʿ* ‘location’ where the air of the *tanahnuh* ‘clearing of the throat’ is attained.

[x]: As for *xā* [x], it occurs like the occurrence of the *hāʔ* [h], except that it is *ʔaxradʒ* ‘outer’, the *mawdʿiʿ* ‘location’ is *ʔasʿlab* ‘more solid’, and the *rutʿuwbat* ‘moistures’ are fewer and *ʔalzaq* ‘stickier’. Consequently, out of the *tašadʿʿiy* ‘fragmentation’ and *tašadʿdub* ‘discontinuation’, it produces *ʔintiqaḍ* ‘a break down’ and *ʔihtizāz* ‘an oscillation’, and the air tumbles, because of that, on the entire surface of the *hanak* ‘palate’.

[y]: As for *ʿayn* [y], it also occurs as a result of something similar to that, except that the *hawāʔ* ‘air’ is not a constrainer of the *rutʿuwbah* ‘moisture’ but the one that *muʿlyyan* ‘makes it boil up’. It comes directly. Its *quwwah* ‘power’ got weakened because it is slightly farther away from the *maxradʒ* ‘exit’. The *ʔihtizāz* ‘oscillation’ in that *rutʿuwbah* ‘moisture’ is greater than before, the constraint towards the front less, and it occurs at *mawdʿiʿ* ‘a location’ of *taʿaryur* ‘gurgling’. If a person were to take some water into his mouth, try to bring it close to the *hulquwm* ‘throat’, then *hāfz* ‘to push’ air through it, he would hear the *sʿawt* ‘sound’ of the *ʿayn* [y]. If he were to forward it a bit and the air was unable to (p.117) rise to it directly but obliquely, and be dependent on it on the push of the air, he would hear a *hāʔ* [h], then a *xāʔ* [x], then the *ʿayn* [y], except that the *rutʿuwbah* ‘moisture’ in *ʿayn* [y] is greater than that in the *xāʔ* [x].

فإنَّ الفُرْجَةَ بَيْنَ الغَضْرُوفَيْنِ السَّافِلَيْنِ تَكُونُ أَضْيَقَ وَالهُوَاءُ يَنْدَفِعُ أَمِيلًا إِلَى قُدَّامٍ وَيَصْدِمُ حَافَةَ التَّقْعِيرِ الَّذِي كَانَ يَصْدِمُهُ هَوَاءُ العَيْنِ عِنْدَ الخُرُوجِ ، وَتلكَ الحَافَةُ صُلْبَةٌ وَالدَّفْعُ مِنْهَا أَشَدُّ ، فَيَقْسِرُ الرُّطوبَةَ وَيَمِيلُهَا إِلَى قُدَّامٍ ، وَيُحَدِّثُ فِيهَا مِنَ التَّشْطِي وَالتَّشْدُبِ مَا كَانَ لَا تُحَدِّثُهُ العَيْنُ ، فَلسَبَبِ (ص. ١١٦) ذلكَ تُسْمَعُ هُنَاكَ خَشُونَةٌ تُحَدِّثُ مِنْ أَصْوَاتٍ حَادَّةٍ ضَعِيفَةٍ تُخَالِطُ النِّعْمَةَ. وَالعَيْنُ فِي المَوْضِعِ الَّذِي يَنَالُهُ هَوَاءُ التَّهْوُوعِ أَدْخَلَ إِلَى الحَلْقُومِ ، وَالحَاءُ فِي المَوْضِعِ الَّذِي يَنَالُهُ هَوَاءُ التَّنْحِخِ.

[خ] وَأَمَّا الحَاءُ فَيُحَدِّثُ مِثْلَ حَدُوثِ الحَاءِ ، إِلَّا أَنَّهُ يَكُونُ أُخْرَجَ ، وَالمَوْضِعُ أَصْلَبَ ، وَالرُّطُوبَاتُ أَقْلَ وَالزَّجَ ، وَيَفْعَلُ مِنَ التَّشْطِي وَالتَّشْدُبِ الانْتِقَاضَ وَالاهْتِزَازَ ، وَيَتَدَحْرَجُ الهَوَاءُ بِسَبَبِ ذلكَ فِي سَطْحِ الحَنَكِ كُلِّهِ.

[غ] وَأَمَّا الغَيْنُ فَإِنَّهَا أَيْضًا تُحَدِّثُ عَن مِثْلِ ذلكَ إِلَّا أَنَّ الهَوَاءَ لَا يَكُونُ قَسَّارًا لِلرُّطُوبَةِ بَلْ مُعْلِيًا لَهَا ، يَأْتِي عَلَى الاستِقَامَةِ ، وَقَدْ ضَعُفَتْ قُوَّتُهَا لِأَنَّهَا بَعُدَتْ يَسِيرًا عَنِ المَخْرَجِ ، وَيَكُونُ الاهْتِزَازُ فِي تلكَ الرُّطُوبَةِ أَكْثَرَ مِنْهَا فِيمَا سَلَفَ ، وَالانْقِسَارُ إِلَى قُدَّامٍ أَقْلَ ، وَيُحَدِّثُ فِي مَوْضِعِ التَّغْرَعْرِ ، وَلَوْ أَنَّ الإِنْسَانَ أَخَذَ فِي فَمِهِ مَاءً وَتَكَفَّفَ تَقْرِيْبَهُ مِنَ الحَلْقُومِ ، ثُمَّ دَفَعَ فِيهِ الهَوَاءَ سَمِعَ صَوْتَ الغَيْنِ ، وَلَوْ قَدَّمَهُ قَلِيْلًا وَلَمْ يَمْكَنِ الهَوَاءُ أَنْ يَصْعَدَ إِلَيْهِ مُسْتَقِيْمًا بَلْ مُنْعَطِفًا ، (ص. ١١٧) وَاعْتَمَدَ عَلَيْهِ بِالحَقْزِ سَمِعَ الحَاءَ ثُمَّ الخَاءَ ثُمَّ الغَيْنَ ، عَلَى أَنَّ الرُّطُوبَةَ فِي الغَيْنِ أَكْثَرَ مِنْهَا فِي الخَاءِ.

[q]: As for the *qāf* [q], it occurs where the *xāʔ* [x] occurs and more interiorly, but with *ḥabs tāmm* ‘a complete obstruction’.

[k]: The *kāf* [k] occurs where the *ḡayn* [ḡ] occurs, except with *ḥabs tāmm* ‘a complete obstruction’ and the rest of the requirements are the same. In *qāf* [q], there is a powerful *ʔinfilāqun* ‘break up’, which the *ruʔwbah* ‘moisture’ for *kāf* [k] does not possess. The relation of *qāf* [q] to *xāʔ* [x] is like the relation of *kāf* [k] to *ḡayn* [ḡ].

[dʒ]: As for *dʒiym* [dʒ], it is produced by a *ḥabs tāmm* ‘complete obstruction’ of the air by the *tʔaraf* ‘edge/tip’ of the tongue, and *ḥasʔrihi* ‘trapping it’ in the *ruʔwbah* ‘moisture’ behind the *tʔaraf* ‘edge/tip’ of the tongue, *yanšaqqu* ‘it breaks up’ at the *ʔitʔlāq* ‘release’ without *ʔimtidād* ‘extension’, (p.118) so that the *tasriyb* ‘seepage’ of air, in all that, is through *maslak dʔyyiq* ‘a narrow passage’, and it is directed towards the *xalal* ‘gap’ of the *rabāʔiyyit* ‘incisors’²⁹ or others. From the *nufuwō* ‘penetration’ of air occurs a *ḥādd* ‘sharp’, *sʔaffār* ‘whistled’ sound, and it mixes with the powerful *farqaḡah* ‘burst’ of the *ruʔwbah* ‘moisture’ that is of tight *luzuwdʒah* ‘stickiness’, a *dʒiym* [dʒ] is present.³⁰

[š]: As for *šiyin* [š], it occurs where the *dʒiym* [dʒ] occurs, except it is not with *ḥabs tāmm* ‘a complete obstruction’, ever. Rather the *tʔaraf* ‘edge/tip’ of the *lisān* ‘tongue’ is ready near the *makān* ‘place’ where it naturally makes contact (p.119) so that it almost touches the section behind the *tʔaraf* ‘edge/tip’ a little, the *tʔaraf* ‘edge/tip’ is freed, not exposed to the air. There are also *ruʔwbat* ‘moistures’, disposed to hinder the *musarrab* ‘seeping’ air in that *madʔiyq* ‘narrowing’, with a *tasriyban* ‘seepage’ accompanied by *sʔafiyrun* ‘a whistle’ mixed with the *farqaḡah* ‘burst’ of those *ruʔwbat* ‘moistures’. It is as though *dʒiym* [dʒ] were a *šiyin* [š] that has not *tuhbas* ‘been obstructed’, and it is as though the *šiyin* [š] is a *dʒiym* [dʒ] that began with *ḥabs* ‘an obstruction’ then *ʔutʔliqat* ‘it got released’.³¹

[dʔ]: As for *dʔād* [dʔ], *maxradʒuhā* ‘its exit’ is slightly forward to that, and its *ḥabs* ‘obstruction’ is complete like the *dʒiym* [dʒ], except it differs from it in two things: the first:

[ق] والقاف تحدث حيث تحدث الخاء ، وأدخل ، ولكن بحبس تام .

[ك] والكاف تحدث حيث تحدث الغين ، ولكن بحبس تام ، وسائر الأحوال بحالها . وفي القاف انفلاق قوي ليس للرطوبة مثله في الكاف ، ونسبة القاف إلى الخاء كنسبة الكاف إلى الغين .

[ج] وأما الجيم فإنه يحدث من حبس تام للهواء بطرف اللسان وحصره في رطوبة وراء طرف اللسان ، ينشق عند الإطلاق من غير امتداد ، (ص. ١١٨) فيكون تسريب الهواء مع ذلك في مسلك ضيق وموجها نحو خلل الرباعيات أو غيرها ، فيحدث من نفوذ الهواء فيها صوت حاد صقار ، ويختلط بفرقة الرطوبة القوية الشديدة اللزوجة فيكون الجيم .

[ش] وأما الشين فيحدث حيث يحدث الجيم ، إلا أنه لا يكون بحبس تام البتة ، بل يتهيأ طرف اللسان يقرب من المكان الذي يلمسه بالطبع (ص. ١١٩) حتى يكاد أن يلمسه بعد الطرف منه شيء ، والطرف مخلى ، غير متعرض للهواء ، ومعد هناك رطوبات تعاقب الهواء المسرب في ذلك المضيق تسريبا يتبعه صفير مختلط بفرقة تلك الرطوبات ، فكان الجيم شين لم تحبس ، وكان الشين جيم ابتدئت بحبس ثم أطلقت .

[ض] وأما الضاد فإن مخرجها أقدم قليلا من ذلك ، والحبس فيه تام كالجيم ، ولكن تخالفها بشيين: أحدهما:

²⁹This makes specific about the teeth which the first version does not specify.

³⁰Cf. End of [š] below for more details.

³¹i.e. [dʒ] affricated sound. To repeat, the fricative is not [š] but [ʒ].

the air is not required to be directed to the narrows of the *xalal* ‘gap’ of the teeth, creator of *sʿafiyar* ‘a whistle’; and the second: the *rutʿuwbah* ‘moisture’ in which the air *yuhbas* ‘is obstructed’, after the release, is greater, and the air forces it, *munhasʿiran* ‘being trapped’ within it, until a bigger *fuqāʿah* ‘bubble’ is created then it bursts not in the *madʿiyq* ‘narrow’, nor is it with the *luzuwdzah* ‘stickiness’ of the *rutʿuwbah* ‘moisture’ of *ḡayn* [ɣ], thus the sound of *dʿād* [dʿ] occurs.

[s]: As for *siyn* [s], *maxradʒuhu* ‘its exit’ is at these *maxāridʒ* ‘exits’. But its dependence is on the *furadʒ* ‘apertures’ (p.120) between the *ʔasnān* ‘teeth’, completely. Its *ḡabs* ‘obstruction’ is incomplete and its air is not exposed to *rutʿuwbah* ‘a moisture’ that *tatafarqaʿ* ‘bursts’.

[sʿ]: As for the *sʿād* [sʿ], it is like *siyn* [s], except that the *masrab* ‘course’ of the air engages a bigger portion of the *lisān* ‘tongue’, *tʿuwlan* ‘length-wise’ and *ʿardʿan* ‘width-wise’. In the *lisān* ‘tongue’ occurs something like a *taʿqiyar* ‘hollowing’ so that the release of the air is like *dawīyyun* ‘an echo’. There is neither in the *siyn* [s], nor in the *sʿād* [sʿ], nor in the *dʿād* [dʿ] *tahziyz* ‘an oscillation’ of the *rutʿuwbāt* ‘moistures’ nor *tahziyz* ‘an oscillation’ of a [skin] surface.³²

[z]: As for *zāy* [z], it occurs also near the *maudʿiʿ* ‘location’ where the *siyn* [s] and the *sʿād* [sʿ] occur; however, the *tʿararf* ‘edge/tip’ of the tongue, in it, is lower, and what is beyond it is closer and higher than the surface of the *ḡanak* ‘palate’ as the one that touches some parts, width-wise, but not others. However, it is less so, lengthwise, than what the one brings close to the surface of the *šadʒr* ‘soft palate’ and the *ḡanak* ‘palate’ in the *siyn* [s]. The purpose in that is that there occurs *ʔihtizāz* ‘an oscillation’ on the *satʿh* ‘surface’ of the *lisān* ‘tongue’ and the *satʿh* ‘surface’ of the *ḡanak* ‘palate’, in order to join that *ʔihtizāz* ‘oscillation’ with the *sʿafiyar* ‘whistle’ that exists from the flow of air through the *xalal* ‘gap’ of the teeth, but in the rest of things, it is like *siyn* [s]. The *ʔihtizāz* ‘oscillation’ that occurs in *zāy* [z] (p.121) is almost like the *takriyr* ‘repetition’ that occurs in *rā* [r], except that in the *rā* [r] it is *ʔirtiʿād* ‘a trembling’ of the *satʿh* ‘surface’ of the tongue *fiy*

³²If *tahziyz* ‘oscillation’ is understood in the current sense of vibratory motion of voicing, then the segment *dʿād* [dʿ] does not belong in this group with respect to voicing.

أَنَّهَا لَا يُتَكَلَّفُ فِيهَا تَوْجِيهُ الْهَوَاءِ إِلَى مَضَائِقِ خَلَلِ الْأَسْنَانِ مُحْدِثِ صَفِيرٍ، وَالثَّانِي: أَنَّ الرُّطُوبَةَ الَّتِي يُحْبَسُ فِيهَا الْهَوَاءُ بَعْدَ الْإِطْلَاقِ تَكُونُ أَعْظَمَ، وَيَدْفَعُهَا الْهَوَاءُ مُتَحَصِرًا فِيهَا حَتَّى يَحْدُثُ مِنْهَا فِقَاعَةٌ أَكْبَرُ ثُمَّ تَتَفَقَّأُ لَا فِي مَضِيقٍ، وَلَا يَكُونُ فِي لَزُوجَةٍ رَطُوبَةٍ الْغَيْنِ، فَيَحْدُثُ صَوْتُ الضَّادِ.

[س] وَأَمَّا السَّيْنُ فَمَخْرَجُهُ عِنْدَ هَذِهِ الْمَخَارِجِ، وَلَكِنَّ الْأَعْتِمَادَ فِيهَا عَلَى الْفُرَجِ الَّتِي (ص. ١١٢٠) بَيْنَ الْأَسْنَانِ بِتَمَامِهَا، وَحَبْسُهَا غَيْرُ تَامٍ، وَلَا يَعْرِضُ لِهَوَائِهَا رَطُوبَةٌ تَتَفَرَّقُ.

[ص] وَالصَّادُ كَالسَّيْنِ إِلَّا أَنَّ مَسْرَبَ الْهَوَاءِ فِيهِ يَأْخُذُ مِنَ اللِّسَانِ جُزْءًا أَعْظَمَ طَوِيلًا وَعَرْضًا، وَيَحْدُثُ فِي اللِّسَانِ كَالْتَقْعِيرِ حَتَّى يَكُونَ لَانْفِلَاتِ الْهَوَاءِ كَالدَّوِيِّ، وَلَيْسَ فِي السَّيْنِ وَلَا فِي الضَّادِ وَلَا فِي الضَّادِ تَهْزِيضٌ رَطُوبَاتٍ وَلَا تَهْزِيضٌ سَطْحِ جِلْدٍ.

[ز] وَأَمَّا الزَّايُ فَإِنَّهَا تَحْدُثُ أَيْضًا قَرِيبًا مِنَ الْمَوْضِعِ الَّذِي تَحْدُثُ فِيهِ السَّيْنُ وَالصَّادُ، وَلَكِنْ يَكُونُ طَرَفُ اللِّسَانِ فِيهَا أَوْخَفَ، وَمَا بَعْدَهُ أَقْرَبَ وَأَرْفَعَ مِنْ سَطْحِ الْحَنَكِ كَالْمُمَاسِّ بِالْعَرَضِ أَجْزَاءً دُونَ أَجْزَاءٍ، وَلَكِنَّهَا أَقْلُ أَخْذًا فِي الطَّوِيلِ مِمَّا يَأْخُذُهُ الْمُقْرَبُ مِنْ سَطْحِ الشَّجَرِ وَالْحَنَكِ فِي السَّيْنِ. وَالْغَرَضُ فِي ذَلِكَ أَنْ يَحْدُثَ هُنَاكَ اهْتِرَازٌ عَلَى سَطْحِ اللِّسَانِ وَسَطْحِ الْحَنَكِ، لِيَجْتَمَعَ ذَلِكَ الْاهْتِرَازُ مَعَ الصَّفِيرِ الَّذِي يَكُونُ مِنْ تَسْرُبِ الْهَوَاءِ فِي خَلَلِ الْأَسْنَانِ، وَأَمَّا فِي سَائِرِ الْأَشْيَاءِ فَهُوَ كَالسَّيْنِ، وَيَكَادُ الْاهْتِرَازُ الَّذِي يَقَعُ فِي الزَّايِ أَنْ (ص. ١٢١) يَكُونَ تَكْرِيرًا كَالْتَكْرِيرِ الْوَاقِعِ فِي الرَّاءِ. إِلَّا أَنَّ الَّذِي فِي الرَّاءِ إِنَّمَا يَقَعُ ارْتِعَادٌ سَطْحِ اللِّسَانِ فِي

ʔal-tʿuwl ‘lengthwise’, while here, it is *fiy ʔal-ʕardʿ* ‘width-wise’. There is, therefore, here what the *ʔihtizāz* ‘oscillation’ necessitates in differentiating what is heard together,³³ while, there, there is one after the other and repeats.³⁴

[tʿ], [t], [d]: As for the *tʿāʔ* [tʿ], the *tāʔ* [t], and the *dāl* [d], *maxāridʒuhā* ‘their exits’ are the front of the *satʿh* ‘surface’ that is stretched on the *ḥanak* ‘palate’. And all of them occur by *ḥabasātin tāmmah* ‘complete individual obstructions’, *qalʕ* ‘plucking’, then exiting of the air, suddenly.

[tʿ]: The *tʿāʔ* [tʿ] is obstructed at that *maudʿiʕ* ‘location’ a greater part of the *tʿaraf* ‘edge/tip’ of the tongue, and behind it, the *dʿilʕay* ‘two sides’ of the tongue, and *tuqaʕʕiru* ‘it hollows out’ the *wasatʿ* ‘center’ of the tongue behind that *maḥbas* ‘place of obstruction’, so that *dawiiyun* ‘an echo’ occurs in the air at the freeing, then *yuqliʕu* ‘it releases’. The *ḥabs* ‘obstruction’ is with a powerful force.

[t]: As for *tāʔ* [t], it is like it³⁵ in everything, except the *ḥabs* ‘obstruction’ is with the *tʿaraf* ‘edge/tip’ of the tongue only.

[d]: As for *dāl* [d], it *tufāriqu* ‘differs’ from *tʿāʔ* [tʿ] since there is no *ʔitʿbāq* ‘covering’ in it, and *tuxālifu* ‘opposes’ *tʿāʔ* [tʿ], (p.122) and *tāʔ* [t] as the *ḥabs* ‘obstruction’ in it is not *qawiyy* ‘powerful’. And probably, that it is *fiy ʔal-kamm* ‘quantitatively’ much less than the *ḥabs* ‘obstruction’ of *tāʔ* [t]. The three share in the fact that the *qalʕ* ‘plucking/release’ is with *ḍʒirm* ‘an object’ that is *ratʿib* ‘moist’ and *layyin* ‘soft’ from *sʿalb* ‘a solid’ *dʒirm* ‘object’.

[θ]: As for *θāʔ* [θ], it exists by depending on the air at the *maudʿiʕ* ‘location’ of the *tāʔ* [t] without *ḥabs* ‘a obstruction’,³⁶ and with *ḥabs* ‘an obstruction’ at the *tʿaraf* ‘edge/tip’ of the tongue to make the *xalal* ‘gap’ narrower, so that there is a slight whistle at the *qalʕ* ‘release’. The *θāʔ* [θ] is like an adjusted *siyn* [s] by *ḥabs* ‘obstructing’ and *tadʿiyiq* ‘narrowing’ the *furadʒ* ‘apertures’ of the path of its *sʿaffār* ‘whistler’ air.

الطول، وها هنا في العرض، فيكون إذن ها هنا ما يوجبُهُ الاهتزازُ من اختلافِ المسموع معاً، وهناك واحداً بعدَ آخرٍ فيتكررُ.

[ط]، [ت]، [د]، [د] وأما الطاءُ والطاءُ والذالُّ فإنَّ مخرجَها من المقدم من السطح الممتدَّ على الحنك، وتحدثُ كلها من حبساتٍ تامَّة، وقلع، ثمَّ إخراجِ هواءٍ دفعةً،

[ط] لكنَّ الطاءَ تُحبسُ في ذلكَ الموضعِ بجزءٍ من طرفِ اللسانِ أعظم، ووراءَهُ بضلعيِّ اللسانِ وتقعُر وسطَ اللسانِ خلفَ ذلكَ المحبسِ، ليحدثَ هناكَ للهواءِ دويٌّ عندَ الإفراجِ ثمَّ يقلع، ويكونُ الحبسُ بشدَّةٍ قويِّ.

[ت] والطاءُ فيكونُ مثله في كلِّ شيءٍ، إلا أنَّ الحبسَ بطرفِ اللسانِ فقط.

[د] وأما الذالُّ فتفارقُ الطاءَ إذ لا إطباقَ فيها وتخالفُ الطاءَ (ص. ١٢٢) والطاءَ إذ الحبسُ فيه غيرُ قويِّ، وعساهُ أن يكونَ في الكمِّ أقلَّ قليلاً من حبسِ الطاءِ. والثلاثةُ تشتركُ في أنَّ القلْعَ يجرِمُ رطبٍ لينٍ عن جرمٍ صلب.

[ث] وأما التاءُ فتخرجُ باعتمادٍ من الهواءِ عندَ موضعِ التاءِ بلا حبسٍ، وحبسٍ عندَ طرفِ الأسنانِ، ليصيرَ الخلُّ أضيّق، فيكونُ صفيراً قليلاً معَ القلْع، وكانَ التاءُ سينُّ ثلوفيت بحبسٍ وتضييقٍ فرَجَ مسلكِ هوائِها الصقَّارِ.

³³In the oscillation of [z].

³⁴In the oscillation of [r]

³⁵i.e. like [tʿ].

³⁶This indicates that the [t] is dental like [θ].

[ð]: The *ðāl* [ð], its relation to *zāy* [z] is the relation of the *θāʔ* [θ] to *siyn* [s], but it differs from *θāʔ* [θ] in the *ʔihtizāz* ‘oscillation’, except that the *ħabs* ‘obstruction’ shortens it and the *sʔafiyar* ‘whistle’.

[ðʔ]: The *ðāʔ* [ðʔ] is before both of them in *maxradʒ* ‘exit’, and it does not *taxrudʒu* ‘exit’ from *abs tāmm* ‘a complete obstruction’ but from *ħabs* ‘a obstruction’ like the *ʔiṣmām* ‘rounding’ of a small part of the *wasatʔ* ‘center’ of the *tʔaraf* ‘edge/tip’ of the *lisān* ‘tongue’ used as a guide that (p.123) what follows the *ʔasʔl* ‘root’ of the tongue be exposed to the air with its *rutʔuwbah* ‘moisture’, then the air, after a slight *ħabs* ‘obstruction’, passes through it *salisan* ‘fluently’ with a very soft *sʔafiyar* ‘whistle’, but it does have the sound of *rutʔuwbah* ‘moisture’.

[tʔ], [l], [dʒ]: *tʔāʔ* [tʔ], *lām* [l], *dʒiyam* [dʒ] and other letters, some of them *yaxrudʒ* ‘exit’ from *maxāridʒ* ‘exits’ of others, but they differ in *hayʔah* ‘construction’, and the more appropriate *mawdʔiʔ* ‘location’ for each one of them is different.

[l]: The occurrence of *lā* [l], by *ħabs* ‘an obstruction’ by the *tʔaraf* ‘edge/tip’ of the tongue, is *ratʔib* ‘moist’ but not very powerful, then *qalʔin* ‘release’ towards the front slightly. Dependence on it is more on the latter part of the tongue that is in contact with what is above than dependence on the *tʔaraf* ‘edge/tip’ of the tongue. The air *ħafz* ‘push’ is not powerful, for if the *ħafz* ‘push’ and the tension were great, a letter like *tʔāʔ* [tʔ] would exit.

[r]: If the *tʔaraf* ‘edge/tip’ of the tongue were subject to the *mawdʔiʔ* ‘location’ where it touches it for *lām* [l], without a true contact nor adherence to any moisture, then *ħāffatāhu* ‘its two edges’ are flattened by the *mutʔawwilatayn* ‘two lengthening’ muscles to a greater extent than the *taʔriydʔ* ‘flattening’ of the *tʔaraf* ‘edge/tip’ itself, and then it is subjected to the *hawāʔ* ‘air’ so that *naʔadʔahu* ‘it would toss it’ and *ʔarʔadah* ‘make it tremble’, just as the wind does with everything soft that is subject to it, hanging by one of its sides from a thing, by means of *ħasʔr* ‘trapping’ and a powerful push, towards the *tadʒwiyf* ‘concavity’ that is at the end of the *minxar* ‘nostril’, to circulate within it and create *dawiyyan* ‘an echo’, then they are released together.

[n]: As for *nuwn* [n], its *ħabs* ‘obstruction’ is slightly higher than the natural obstruction for *bā* [b], and is

[ذ] والدَّالُّ نَسْبُهَا إِلَى الزَّاي نَسْبَةُ النَّاءِ إِلَى السَّيْنِ بَعِينَهُ، وَتَفَارِقُ النَّاءَ بِالْأَهْتِزَازِ إِلَّا أَنَّ الْحَبْسَ يُقْصِرُ مِنْهُ وَمِنَ الصَّفِيرِ.

[ظ] وَالظَّاءُ قَبْلَهُمَا فِي الْمَخْرَجِ، وَلَيْسَتْ تَخْرُجُ عَنْ حَبْسِ تَامِّ بَلْ حَبْسِ مِثْلِ الْإِشْمَامِ بجزءٍ صغيرٍ من وسط طرف اللسان يُتَوَخَّى بِهِ أَنْ (ص. ١٢٣) يَكُونَ مَا يَلِي أَسْلَ اللِّسَانِ مُتَعَرِّضًا لِلْهَوَاءِ بِرَطُوبِيَّتِهِ، ثُمَّ يَمْرُؤُ الْهَوَاءُ بَعْدَ الْحَبْسِ الْخَفِيفِ مَرًّا سَلِسًا خَفِيَّ الصَّفِيرِ جِدًّا، وَلَكِنْ فِيهِ صَوْتُ رَطُوبَةٍ.

[ط] ، [ل] ، [ج] وَالطَّاءُ وَاللَّامُ الْجِيمُ وَحُرُوفٌ أُخْرَى يَخْرُجُ بَعْضُهَا مِنْ مَخْرَجِ بَعْضٍ، إِلَّا أَنَّهَا تَخْتَلِفُ فِي الْهَيْئَةِ، وَبِأَنَّ الْمَوْضِعَ الْأَوْفَقَ لِكُلِّ وَاحِدٍ مِنْهَا أُخْرَى.

[ل] وَوَحْدُوثُ اللَّامِ بِحَبْسٍ مِنْ طَرَفِ اللِّسَانِ رَطْبٍ غَيْرِ قَوِيٍّ جِدًّا ثُمَّ قَلَعَ إِلَى فُذَامٍ قَلِيلًا، وَالْإِعْتِمَادُ فِيهَا عَلَى الْجُزْءِ الْمُتَأَخَّرِ مِنَ اللِّسَانِ الْمَمَّاسِ لِمَا فَوْقَهُ أَكْثَرُ مِنَ الْإِعْتِمَادِ عَلَى طَرَفِ اللِّسَانِ، وَلَيْسَ الْحَفْزُ لِلْهَوَاءِ بِقَوِيٍّ، وَلَوْ كَانَ الْحَفْزُ وَالشَّدُّ قَوِيًّا خَرَجَ حَرْفٌ كَالطَّاءِ.

[ر] وَإِنْ كَانَ طَرَفُ اللِّسَانِ مُتَعَرِّضًا لِلْمَوْضِعِ الَّذِي يَمْسُهُ فِي اللَّامِ مِنْ غَيْرِ مَسٍّ صَادِقٍ وَلَا التَّصَاقِ بِرَطُوبَةٍ، ثُمَّ عُرِّضَ حَافَتَاهُ بِالْعَضَلَتَيْنِ الْمَطْوِلَتَيْنِ تَعْرِيزًا أَقْوَى مِنْ تَعْرِيزِ الطَّرَفِ نَفْسِهِ، وَحَمَلَ عَلَيْهِ بِالْهَوَاءِ حَتَّى نَفِضَهُ وَأَرَعَدَهُ، كَمَا تَفْعَلُ الرِّيحُ بِكُلِّ لَيِّنٍ مُتَعَرِّضٍ لَهُ مُتَعَلِّقٍ مِنْ طَرَفٍ مِنْهُ بِشَيْءٍ (ص. ١٢٤) بِحَصْرٍ وَبِحَفْزٍ قَوِيٍّ إِلَى التَّجْوِيفِ الَّذِي فِي آخِرِ الْمَخْرَجِ لِيَدُورَ فِيهِ وَيَفْعَلُ دَوِيًّا، ثُمَّ يَطْلُقَانِ مَعًا.

[ن] وَأَمَّا النُّونُ فَبِإِنَّ الْحَبْسَ فِيهَا أَرْفَعُ قَلِيلًا مِنَ الْحَبْسِ الطَّبِيعِيِّ لِلْبَاءِ،

with the *tʿaraf* ‘edge/tip’ of the tongue, except that the bulk of the air is disposed towards the *ḡunnah* ‘nasality’ of the *minxar* ‘nostril’. Hence, the *nuwn* [n] is of *ʔartʿab wa ʔadxal* ‘a more moist and inner’ obstruction, and *ʔakθar* ‘a greater’ *dawiyy* ‘echo’ and *ḡunnah* ‘nasality’.

[w]: As for the *sʿāmitah* ‘silent’ *wāw* [w], it occurs where the *fāʔ* [f] occurs, but with *dʿaytʿin* ‘pressure’ (p.84) and air push that is weak, and does not compete in its resistance with the surface of the *šafah* ‘lip’, it then attains its full status by *qalʿ* ‘a release’ also to the extent of the contact of the *šafah* ‘lip’ for the *fāʔ* [f].³⁷

[y]: As for the *sʿāmitah* ‘silent’ *yāʔ* [y], it occurs where the *tʿāʔ* [tʿ], *dziym* [dʒ] and others occur, but by being subject to *ħabsin yasiyr* ‘a slight obstruction’ and *sʿafiyrin dʿafiyf* ‘a weak whistle’. Though, steady due to it, (p.125) the letter *rāʔ* [r] occurred. The *takriyr* ‘repetition’ is heard in which there is the *ʔirtiʿd* ‘trembling’ towards the front.

[f],[b]: The *fāʔ* [f] and the *bāʔ* [b] occur at one and the same *maxra* → ‘exit’ which is the *šafah* ‘lip’, except that *bāʔ* [b] is with *ħabs tām* ‘a complete obstruction’ with a firm contact of two soft objects and then rapid *qalʿ* ‘release’ with the sudden push of the *hawāʔ musʿawwat* ‘voiced air’ to the outside.

[f]: As for the *fāʔ* [f], the *ħabs* ‘obstruction’ in it is not *tām* ‘complete’, with *ʔadʒāʔz* ‘parts’ of the *šafah* ‘lip’ narrowed but not in contact. Along with it, there is a continuous flow centrally, so that the *ħabs* ‘obstruction’ of edges of the *maxradʒ* ‘exit’ are active in *ʔihtizāzihi* ‘its oscillation’ and its proceeding like a soft *sʿafiyr* ‘whistle’. The relationship of *fāʔ* [f] to *bāʔ* [b] is the relationship of the *hāʔ* [h] to the *hamzah* [ʔ].

[m]: As for *miym* [m], its *ħabs* ‘obstruction’ in it is *tām* ‘complete’, with parts of the *šafah* ‘lip’ that are *ʔaybas* ‘drier’ and *ʔaxradʒ* ‘outer’. With the *qalʿ* ‘plucking’, the air flow to the outside of the *fam* ‘mouth’ is not total but some of it is disposed of with (p.126) *qalʿ* ‘a release’ simultaneously, commensurate with the *ħabs* ‘obstruction’.

As for the *musʿawwitāt* ‘voiced ones’, their status and their effects for me are complicated.

وبطرف اللسان، إلا أن جُلَّ الهواء يُصرفُ فيها إلى عُنَّةِ المنخر، فتكونُ النونُ أرطبَ وأدخلَ حبساً وأكثرَ دويًا وعُنَّةً.

[و] وأما الواوُ الصَّامِتَةُ فإنها تحدثُ حيثُ تحدثُ الفاءُ، ولكنْ بضغْطٍ وحفزٍ للهواءِ ضعيفٍ، ولا ينافِسُ في انضغاطِهِ سطحَ الشفَّةِ، ثم يُتَمُّ هيئَتُهُ بقلْعٍ أيضاً للمقدارِ المُطْبِقِ مِنَ الشَّفَّةِ فِي الفاءِ.

[ي] وأما الياءُ الصَّامِتَةُ فتحدثُ حيثُ تحدثُ الطَّاءُ والجيمُ وغيرُ ذلكَ، ولكنْ بتعرُّضٍ للحبسِ يسيرٍ وصغيرٍ ضعيفٍ، ومعَ ذلكَ (ص. ١٢٥) ثابتٌ حدثٌ منه حرفُ الرَّاءِ، وسُمِعَ التكريرُ الذي فيه الارتعادُ قُدماً.

[ف، ب] والفاءُ والباءُ تحدثانِ عندَ مخرجِ واحدٍ بعينه وهو الشَّفَّةُ، إلا أنَّ الباءَ بحبسٍ تامٍّ قويٍّ لالتقاءِ جِرمينِ لينينِ ثم انفلاعهما وانحفازِ الهواءِ المصوَّتِ دُفْعَةً إلى خارجِ.

[ف] وأما الفاءُ فيكونُ الحبسُ فيها غيرَ تامٍّ بل بأجزاء من الشَّفَّةِ مضيقةٍ غيرِ متلاقيةٍ، ومعَهُ إطلاقٌ مستمرٌّ في الوسطِ فيفعلُ حبسُ أطرافِ المخرجِ باهتزازِهِ وبمجازِهِ كالصَّفِيرِ الخفيِّ، ونسبةُ الفاءِ إلى الباءِ نسبةُ الهاءِ إلى الهمزةِ.

[م] وأما الميمُ فإنَّ الحبسَ فيها تامٍّ وبأجزاء من الشَّفَّةِ أيبسَ وأخرجَ، وليسَ تسريبُ الهواءِ معَ القلْعِ إلى خارجِ الفمِ كلِّه بل يصرِفُ بعضُهُ (ص. ١٢٦) قلْعَ دُفْعَةً بمقدارِ الحبسِ.

وأما المصَوَّتاتُ فأمرُها وتأثيرُها عليَّ كالمشكَلِ،

³⁷Similar to the Persian [w/ʊ]

I do, however, think that the *maxāridʒ* ‘exits of the *sʔuyrā* ‘shortest’ *ʔalif* [ā] and the *kubrā* ‘longest’ one are the *ʔitʔlāq* ‘release’ of air *salisan* ‘fluently’ without *muzāḥam* ‘crowded’.

[u]: The two *wāw* [w]s, their *maxradʒ* → exits are with the closest *muzāḥamah* ‘crowding’ and *tadʔyiq* ‘narrowing’ of the *šafatayn* ‘two lips’, and a slight dependence, for the exiting, on what follows above.

[i]: The two *yāʔ* [y]s, the *muzāḥamah* ‘crowding’ in the two of them is to depend slightly on what follows from below. Each *sʔuyrā* ‘short one’ occurs in the shorter of *ʔazminah* ‘intervals of time’, and each *kubrā* ‘long one’ occurs in their multiples.

[ا] لكّني أظنُّ أنّ الألفَ الصُّغرى والكبرى
مخرجُهما من إطلاقِ الهواءِ سلساً غيرَ
مزاحمٍ.

[و] والواوان مخرجهما مع أدنى مزاحمة
وتضييقٍ للشفتين واعتمادٍ في الإخراجِ على
ما يلي فوق اعتماداً يسيراً.

[ي] والسياءان تكونُ المزاحمةُ فيهما
بالاعتمادِ على ما يلي أسفلاً قليلاً، وكلُّ
صُّغرى فهي واقعةٌ في أصغرِ الأزمنة، وكلُّ
كُبرى ففي أضعافها.

The Fifth Section-2

On the *huruwf* ‘Letters’ that are similar to these *huruwf* ‘Letters’

(p.127) Here, there are *huruwf* ‘letters’ other than these *huruwf* ‘letters’ that occur between every two letters, in which each of the two is akin to the other in *šarkihi*, ‘its sharing’ in *musabbibihi* ‘its causer’.

[k-q]: Among them is the light *kāf* [k] that the Arabs in this our generation use as *badal* ‘a substitute’ for the *qāf* [q]; it occurs where the *kāf* [k] occurs, but is more inner and with *ʔadʔaf* ‘a weaker’ *ħabs* ‘obstruction’.

[dʒ]: Also the letter that is similar to *dʒiym* [dʒ], is heard in the speech of the Persian *tfāh* ‘well-n’. The relation of this *dʒiym* [dʒ] to the Arabic *dʒiym* [dʒ] is the relation of the Arabic *kāf* [k] to the other than (p.128) Arabic *kāf* [k]. because it is produced by a *šadd* ‘tightness’ at the *ħabs* ‘obstruction’ that is powerful, with a greater *dʒuzʔ* ‘part’ of the tongue and with *qalʔ wa ħafz* ‘a plucking and pushing’ of the air that is *ʔašadd* ‘tighter’.

There are here also three letters that are similar to *dʒiym* [dʒ] that are neither in Arabic nor Persian, and in all of them, the *farqaʔah* ‘burst’ that is in *dʒiym* [dʒ] is cut off, and *dʒarsuhā* ‘its ring’, is reduced to *ħams* ‘a whisper’ and a dry *sʔafiyr* ‘whistle’. At times they tend towards quasi-*zāy* [z], so that from the air that creates the *ħams* ‘whisper’, *ħazz* ‘an oscillation’, like the *ħazz* ‘oscillation’ that is in the *zāy* [z], occurs. At other times they tend towards a quasi-*siyn* [s] so that the air active in the formation of *dʒiym* [dʒ], *yusarrabu* ‘is made to seep’ dry through the *xalal* ‘gap’ between the teeth without its being exposed to *ħazz* ‘an oscillation’ of anything. At other times they tend towards a quasi-*sʔad* [sʔ] and the likes of that, and to an increase in *ʔitʔbāq* ‘covered-ness’.

[s -sʔ]: (p129) Among them is the *siyn* [s] that is a *sʔād* [sʔ]-like. It occurs in using *dʒuzʔ* ‘a part’ of the tongue that is *ʔaʔradʔ* ‘wider’ and *ʔatʔwal* ‘longer’, towards the inside.

[s - z]: Among them is a *siyn* [s] that is *zāy* [z]-like that is frequent in the language of Khawarizm. It occurs by prepairing the *ħayʔah* ‘construction’ from the like of which the *siyn* [s] occurs, then occurs, to the muscle that *bātʔihah* ‘flattens’ the tongue, *ʔirtiʔād* ‘a trembling’, as it occurs in *zāy* [z]. So it tends towards similarity to the *zāy* [z].

الفصل الخامس في الحروف الشبيهة بهذه الحروف

وهاهنا حروفٌ غيرُ هذه الحروف، تحدث بينَ حرفين حرفين فيما يُجانسُ كلَّ واحدٍ منهما بشرِكِهِ في مسبِّهِ.

[ك] فمن ذلك الكافُ الخفيفةُ التي تستعملُها العربُ في عصرنا هذا بدلَ القاف، وهي تحدثُ حيثُ الكاف، ولكنْ أدخلَ وبحبسٍ أضعف.

[ج] وأيضاً الحرفُ الشبيهُ بالجميم يُسمع من قول الفارسيين "جاه" ونسبهُ هذه الجيم إلى الجيم العربية كنسبة الكاف العربية إلى الكاف الغير (ص. ١٢٨) العربية، لأنَّها تحدثُ عن شدِّ عندَ الحبسِ قوي، وبجزءٍ من اللسانِ أكبر، وبقلع وحفزٍ للهواءِ أشدَّ.

وهاهنا أيضاً حروفٌ ثلاثةٌ تُشبهُ الجيم ليست في العربية ولا في الفارسية، وكلُّها تُبترُّ عنها الفرقةُ التي في الجيم، ويزولُ جرْسُها إلى الهمسِ والصَّفِيرِ اليابسِ، فتارةً تضربُ إلى شِبهِ الزَّاي، بأنْ يحدثَ عن الهواءِ المولدِ للهمسِ هزٌّ كالهزِّ الذي في الزَّاي، وتارةً تضربُ إلى شِبهِ السَّيْنِ بأنْ يُسربَّ الهواءُ الفاعلُ لهيئةَ الجيمِ يابساً في خللِ الأسنانِ من دونِ تعرُّضِهِ لهزٍّ شيءٍ، وتارةً تضربُ إلى شِبهِ الصَّادِ لمثلِ ذلك وزيادةً في الإطباقِ.

(ص. ١٢٩) ومن ذلك سينٌ صاديةٌ تحدثُ من استعمالِ جزءٍ من اللسانِ أعرض وأطول إلى داخل.

ومن ذلك سينٌ زائبةٌ تكثُرُ في لغةِ خوارزم، وتحدثُ بأنْ تُهيأَ الهيئةُ التي تحدثُ عن مثلها السينِ، ثم يحدثُ في العضلةِ الباطحةِ للسانِ ارتعادٌ، كما يحدثُ في الزاي فتضربُ إلى مشابهةِ الزاي.

[š -z]: Among them there is a *šiyin* [š] that is *zāy* [z]-like, that is heard in the Persian language when they say: *zarf* ‘deep’. It is *šiyin* [š] that occurs by the tongue approximating the surface of the *šadẓr* ‘velum’, by *tahziyz* ‘oscillation’ of its surface, and producing *hams* ‘a whisper’ in it. So a *šiyin* [š] is begun with a section of the tongue and is concluded with a *zāy* [z] at *tʿarafīhi* ‘its edge/tip’. That is why it is heard at the boiling of sticky/viscous liquids, like oil.

[r -ʔ]: Among them is a *rāʔ* [r] that is *ʔayn* [ʔ]-like. Its relation to *rāʔ* [r] and *ʔayn* [ʔ] is the relation of the letter mentioned before it to the *zāy* [z] and *šiyin* [š]. It occurs by setting the air into a gurgle, the *taʔaryʔur* ‘gurgle’ that is productive of, (p. 130), the *ʔayn* [ʔ], then the *tʿaraf* ‘edge/tip’ of the tongue *yuraʔʔad* ‘is caused to tremble’, or that tremble occurs in *sʿifāq* ‘aponeurosis’ of the *minxar* ‘nostril’, so a *rāʔ* [r] that is *ʔayn* [ʔ]-like occurs.

[r - l]: Also a *rāʔ* [r] that is *lām* [l]-like occurs in that one is not limited to *ʔirtiʔād* ‘a trembling’ of the *tʿaraf* ‘edge/tip’ of the tongue only, but *ʔal-ʔadʿalāt ʔal-mutawassitʿah* ‘the central muscles’ of the tongue are relaxed and *ʔal-tʿarafīyyah* ‘the peripheral ones’ tightened so that *taqbiyb* ‘a doming’ occurs, and the air is sent, depending on that *taqbiyb* ‘doming’, through the *rutʿuwbah* ‘moisture’ in it.

[r]: And a covered *rāʔ* [r], not only the *tʿaraf* ‘edge/tip’ of the tongue *yuraʔʔad* ‘is set trembling’, but also *wasatʿihi* ‘its center’.

[z -ḏʿ]: And a *zāy* [z] that is *ḏʿāʔ* [ḏʿ]-like, in it, the center of the tongue is higher, and the *ʔihtizāz* ‘oscillation’ (p.131) *ʔal-tʿaraf* ‘the edge/tip’ of the tongue is very hidden. It is as though it is in *wasatʿihi* ‘its center’.

[lʿ]: Here there is a *mutʿbaqah* ‘covered’ *lām* [lʿ]. Its relation to the known *lām* [l] is the relation of the *tʿāʔ* [tʿ] to the *tāʔ* [t]. It is frequent in the language of the Turks. It is taken to be another letter. And the *mutafayhiq* ‘sophisticate’ in the language of the Arabs use it, in that it is identical with the known *lām* [l] itself.

ومن ذلك شينٌ زائيةٌ تُسمعُ في الفارسية عند قولهم: "زرف"، وهي شينٌ تحدثُ عن تقريبِ اللسان من سطح الشجر، وتهزير سطحه، وإحداثِ الهمس فيه، فتبتدئُ شينا عندَ جزءٍ من اللسان، وتُختمُ زايا عند طرفه، ولذلك تُسمعُ عند غليان الرطوبات اللزجة كالدُّهن.

ومن ذلك راءٌ غينيةٌ نسبتُها إلى الراء والغين نسبة الحرف المذكور قبلها إلى الزاي والشين، وتحدثُ بأن يُتغرغرَ بالهواء التغرغرَ الفاعلَ (ص. ١٣٠) للغين، ثم يُرعدُ طرفُ اللسان، أو يحدثُ في صفاق المنخر الداخل ذلك الارتعاد فتحدث راءٌ غينية.

وأيضاً راءٌ لاميةٌ تحدثُ بالأ يقتصِرُ على ترعيدِ طرفِ اللسان، بل تُرخي العضلات المتوسطة للسان وتُشجج الطرفية، حتى يحدثُ تقبيبٌ، ويُرسلُ الهواءُ معتمداً على ذلك التقبيب في الرطوبة فيه.

وراءٌ مُطبَّقةٌ يُرعدُ فيها لا الطرف من اللسان فقط بل وسطه.

وزاءٌ ظائنيةٌ يكونُ وسط اللسان فيها أرفعَ والاهتزازُ في (ص. ١٣١) طرف اللسان خفيٌ جداً، وكأنَّه في سطحه.

وهاهنا لامٌ مُطبَّقةٌ نسبتُها إلى اللام المعروفة نسبةً الطاء إلى التاء، وتكثرُ في لغة التُرك، مأخوذة على أنَّها حرفٌ آخر، ويستعملها المُتفَيِّهُقُ في لغة العرب على أنَّها اللام المعروفة بعينها.

[f - b]: Here is a *fāʔ* [f] that is almost like a *bāʔ* [b]. It occurs in the language of the Persians when they say: *vizuwn* ‘ncrease’. It differs from *bāʔ* [b] in that in it there is no complete *ħabs* ‘obstruction’. It differs from *fāʔ* [f] in that the *tadʿiyiq* ‘narrowing’ of the *maxradʒ* ‘exit’ of the *sʿawt* ‘sound’ at the *šafah* ‘lip’ in it is greater, and the *dʿaytʿ* ‘pressure’ of the air is greater, so that almost occurs, due to it, *ʔirtiʔād* ‘a trembling’ in the soft surface of the inner *šafah* ‘lip’.

[b- p]: Among them is the doubled *bāʔ* [b] that occurs in the language of the Persians when they say: *piyruwziy* ‘victory’. It occurs with great tightness in the lips at the *ħbs* ‘obstruction’, and *qalʔ* ‘a plucking’ with *ʔunf* ‘violence’, and with air *dʿaytʿ* ‘pressure’ with *ʔunf* ‘violence’.

(p.132) [m - n]: And the *miym* [m] and the *nuwn* [n], what is in them may be limited to the *dawiyy* ‘echo’ that occurs in the *ʔunnah* ‘nasality’ of the *minxar* ‘nostril’.

وهاهنا فاءٌ تكاد تُشبهُ الباءَ وتقعُ في لغةِ
الفرسِ عند قولهم "فزون" تفارقُ الباءَ بأنَّه
ليسَ فيها حبسٌ تامٌ، وتُفارقُ الفاءَ بأنَّ
تضييقَ مخرجِ الصَّوتِ من الشِّفةِ فيها أكثرُ،
وضغطُ الهواءِ أشدُّ. حتى يكاد يحدثُ منه في
السطحِ اللينِ من باطنِ الشِّفةِ ارتعادٌ.

ومن ذلك الباءُ المشدَّدةُ الواقعةُ في لغةِ
الفرسِ عند قولهم: "بيروزي" وتحدثُ بشدِّ
قويٍّ للشفتينِ عند الحبسِ، وقَلْعِ بعنفٍ
وضغطٍ للهواءِ بعنفٍ.

(ص. ١٣٢) والميمُ والنونُ قد يكونُ منهما
ما يُقتصرُ فيه على الدَّويِّ الحادثِ في عُتَّةِ
المنخرِ.

The Sixth Section-2

In that these *huruwf* ‘letters’ can be heard from *harakātin* ‘motions’ other than *nutʿiqiyah* ‘articulatory’

[h]: (p.133) The *hāʔ* [h]. You hear it when the *hawāʔ* ‘air’ *bi-quwwah* ‘powerfully’ bursts into the same air.

[ʕ]: The *ḥayn* [ʕ]. You hear it when the *hawāʔ* ‘air’ strongly bursts into the water.

[h]: The *hāʔ* [h]. At the *ʔixrādʒ* ‘exiting’ of the air from any narrowing that is *mustaʔradʕin* ‘flattened’, *ratʕib* ‘moist’, and from passing your hand on a *layyin* ‘soft’, *xašin* ‘rough’ *dʒism* ‘body’ with a flat gesture.

[x]: And the *xāʔ* [x] from your rubbing a *dʒāffan* ‘dried up’ *dʒism* ‘body’ with a solid *dʒism* ‘body’ closely and length-wise so that it removes its soft roughness but it does not penetrate it.

[q]: (p.134) And the *qāf* [q] at the *ʔinšiqāq* ‘ripping up’ of *ʔadʒsām* ‘bodies’ especially those with *rutʕuwbah latʕiyfah* ‘delicate moisture’.

[ɣ]: And the *ɣayn* [ɣ] at the *sayaḷān* ‘flowing’ of *rutʕuwbāt* ‘liquids’ in outlets of average narrowness mixed with the air, with a belabored flow, but very rapidly, like the quiver in *murtaʕid* ‘a trembler’ and *qarqarah* ‘rumbling’ from pitchers of average narrowness,³⁸ and from the quiver of a *kaḥiyf* ‘dense’, *raqiyq* ‘delicate’ and *layyin* ‘soft’ *dʒism* ‘body’ in the *riyh* ‘wind’, like a piece of paper.

[k]: And the *kāf* [k]. You hear it from *qarʕ* ‘striking’ a solid *dʒism* ‘body’ with a solid *dʒism* ‘body’ and from the *ʔinšiqāq* ‘tearing up’ of the dry *ʔadʒsām* ‘bodies’.

[dʒ]: And the *dʒiym* [dʒ] from the falling of *rutʕuwbāt* ‘liquids’ into *rutʕuwbāt* ‘liquids’ like a drop of water falling powerfully on water that is more than it and it *taɣuwsʕu* ‘sinks’ into it.

[š]: And the *šiyin* [š] from the *našiyš* ‘hissing’ of the *rutʕuwbāt* ‘liquids/moistures’, that are without *luzuwdʒah* ‘stickiness’ or of little stickiness, and from the *nufuwḏ* ‘penetration’

الفصل السادس

في أن هذه الحروف قد تُسمعُ من حركاتٍ غير تُطقيّة

[هـ] [ص. ١٣٣] الهاءُ تسمعُها عند اندفاع الهواء بقوة في نفس الهواء.

[ع] والعينُ تسمعُها عند اندفاع الهواء بقوة في الماء.

[ح] والحاءُ عند إخراج الهواء من كلِّ مضيقٍ مستعرضٍ رطبٍ، وعن إمرار يدك على جسمٍ ليّنٍ خشنٍ إمراراً منبسّطاً.

[خ] والحاءُ عن حكِّك جسماً جافاً بجسمٍ صلبٍ إلى الدقّة مع الامتداد، بحيث يُزيلُ خشونته اللَّيْنَةَ ولا ينفذُ فيه. (ص. ١٣٣)

[ق] والقافُ عند إنشقاق الأجسام وخصوصاً نواتٍ رطوبةٍ لطيفة.

[غ] والغينُ عند سيلان الرطوبات في المجاري المعتدلة الضيق مختلطةً بالهواء سيلاناً مُتَعَوِّقاً به، ولكنّ سريعاً جداً، مثل المرتعد كقرقرة الأباريق المعتدلة الضيق، وعن ارتعاد جسمٍ كثيفٍ رقيقٍ ليّنٍ في الريح مثل ورقة كاغد.

[ك] والكافُ تسمعُها عن قرع جسمٍ صلبٍ بجسمٍ صلبٍ، وعن انشقاق الأجسام اليابسة.

[ج] والجيمُ عن وقع رطوباتٍ على رطوباتٍ كقطرةٍ من الماء تقع بقوة على ماءٍ أكثر منه فتغوص فيه.

[ش] والشينُ عن نشيش الرطوبات العديمة اللزوجة، أو القليلة اللزوجة، وعن نفوذ

³⁸i.e. at the neck of the pitcher

of the *rutʿuwbāt* ‘liquids/moistures’ into the *xalal* ‘gap’ of dry *ʔadʒsām* ‘bodies’ with narrow outlets, with power.

[dʿ]: (p. 135) And the *dʿād* [dʿ] from *ʔinfilāq* ‘bursting’ of big *faqāqiyʿ* ‘bubbles’ from sticky liquids, from the tearing up of paper, and from *latʿm* ‘a slap’ where the air flows at its center without traversing the *ʔatʿrāf* ‘edges’, except that it is perhaps due to the *quwwah* ‘power’, but often it is like a *tʿāʔ* [tʿ].

[s]: And the *siyn* [s] from the touching of a polished dry *dʒism* ‘body’ with hidden roughness of another *dʒism* ‘body’ like it and passing it on it, and from *naʔx* ‘blowing’ through the exposed teeth of a comb.

[θ] If it is narrowed in closure, a *θāʔ* [θ] is heard.

[z]: If a thin piece of *dʒild* ‘skin’ is placed facing it, *tahtazz* ‘it oscillates’ at the *naʔx* ‘blowing’, or a piece of cloth or a piece of paper, a *zāy* [z] is heard.

[ð]: If it were closed with slackening of the *muhtazz* ‘oscillating body’, then *ðāl* [ð] is heard.

[tʿ]: And the *tʿāʔ* [tʿ] in clapping of the two hands and with the narrowest hollow of *ʔal-rāatayn* ‘the two palms’ with the smallest *taqbiyb* ‘doming’ in which the air is trapped with *dawiyi* ‘an echo’.

[t]: (P.136) And the *tāʔ* [t] from the tapping of the hand with a finger *bi-quwwah* ‘with power’.

[d]: And the *dā* [d] from a weaker one than it.

[r]: And the *rāʔ* [r] from *ʔirtiʿād* ‘a tremble/rattle’ of a cloth exposed to a strong wind, and fixed to its fastener and does not come apart. And it may be heard from the *tadaʔrudʒ* ‘rolling’ of a ball on a board of wood. It is able *tahtazz* ‘to oscillate’ by itself and *yartaʿid* ‘it trembles’.

[l]: And the *lām* [l] from slapping the water with the hand, or by stirring of the fingers in it *bi-ʿunf* ‘with violence’. The air intrudes into it, then wends upwards saturated with *rutʿuwbah* ‘moisture’.

[f]: And the *fāʔ* [f] from the *ħafiyf* ‘rustling/hissing’ of trees and their likes.

الرطوبات في خلل الأجسام اليابسة ضيقة المنافذ بقوة. (ص. ١٣٥)

[ض] والضاد عن انفلاق فقايع كبار من الرطوبات اللزجة، وعن انشقاق الأوراق، وعن لطم ينفذ في وسطها الهواء من غير خرق الأطراف، إلا أن ذلك للقوة ربما بل كثيراً ما يشبه الطاء.

[س] والسين عن مس جرم يابس صقيل فيه خشونة خفية بجرم آخر مثله وإمراره عليه، وعن التفخ في مثل أسنان المشط مكشوفة.

[ث] وإن ضيقت بالسد سمع التاء.

[ز] وإن وُضِعَ في وجهها كجلدة رقيقة تهتز عند التفخ، أو ثوب أو قطعة كاغد، سمع الزاي.

[ذ] فإن سُدَّتْ مع إرخاء المهتر عليها سمع الدال.

[ط] والطاء بتصفيق اليدين وفي الراحتين أدنى تقبيب ينحصر فيه هواء ذو دوي. (ص. ١٣٦)

[ت] والتاء عن قرع اليد بإصبع بقوة.

[د] والدال عن أضعف منه.

[ر] والراء عن ارتعاد ثوب معرض لريح قوية، مستوثق من مشد له لا يفارقه، وقد يُسمع عن تدحرج كرة صلبة على لوح من الخشب، يمكن أن يهتز في نفسه فيرتعد.

[ل] واللام عن لطم الماء باليد، أو زج الإصبع فيه بعنف، يوغل فيه الهواء، ثم ينتهي صاعداً مستتبعا رطوبة.

[ف] والفاء عن حفيف الأشجار وما أشبهها.

[b]: And the *bāʔ* [b] from *qalʕ* ‘plucking’ of soft *ʔadʕsām* ‘bodies’, that are adhering, from each other.

Here, there are also letters that are not written that occur due to causes that are strong and light, (p.137) and most of them are heard from birds and from languages of nations whose languages are similar to tunes of birds.³⁹

I think that I have reached sufficiency, and I have expressed the full extent of my knowledge, and it is time that I conclude the treatise.

The treatise on *maxāridʕ* ‘exits’ of *sʔawt* ‘sound’
and *ħuruwf* ‘letters’

by ʔabi ʕaliy is completed. May God Almighty have mercy on him.

[ب] والباء عن قلع الأجسام اللينة المتلاصقة بعضها عن بعض.

وهاهنا حروف غير مكتوبة، تحدث عن أسباب شديدة وخفيفة، (ص. ١٣٧) ويسمَعُ أكثرها من الطيور، ومن لغات أمم شبيهة اللغات بنغم الطير.

والظنُّ أنّي قد بلغت الكفاية، وعبرتُ عن المقدار الذي تبلغه معرفتي، فحان أن أختم الرسالة.

تمت رسالة مخارج الصّوت
والحروف
لأبي عليّ رحمه الله تعالى.

³⁹This is a possible reference to tone languages. ʔIbn Sīnā lived close to the Chinese boarder, so this is not far fetched.