

## THE RECEPTION OF IBN SĪNĀ'S *PHYSICS* IN LATER ISLAMIC THOUGHT\*

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### Abstract

In the *Physics* of his major encyclopedia *al-Shifāʾ*, Ibn Sīnā does not limit himself to paraphrase Aristotle's *Physics*, but also adds important innovative ideas. However, one may wonder whether they did really influence the later Islamic tradition? Based on the treatise on change, present in Ibn Sīnā's *Physics*, II, 1-4, it is shown that major later thinkers as Bahmanyār b. Marzubān, Abū l-ʿAbbās al-Lawkarī, Fakhr al-Dīn al-Rāzī and Mullā Ṣadrā al-Shīrāzī were using his exposé in a significant way. Certainly, they did it in very different ways, but they clearly expressed their own views with an eye on Ibn Sīnā's doctrine. The present paper details the elements and scope of this influence.

*Key Words:* Ibn Sīnā, Bahmanyār b. Marzubān, Abū l-ʿAbbās al-Lawkarī, Fakhr al-Dīn al-Rāzī, Mullā Ṣadrā al-Shīrāzī, *Physics*.

In Ibn Sīnā's major encyclopedia, *Kitāb al-Shifāʾ*, the book *al-Samāʿ al-ṭabīʿī* constitutes the first volume of the collection of the natural books. In this book, Ibn Sīnā paraphrases Aristotle's *Physics*. However, he does not limit himself to reproducing the Stagirite's ideas. On the contrary, in several respects he sensibly modifies the

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latter's ideas. This immediately manifests itself in his fundamental restructuring of Aristotle's text.<sup>1</sup> Moreover, Ibn Sīnā presents doctrines derived from the "Commentators", especially Alexander of Aphrodisias, Themistius and John Philoponus.<sup>2</sup> The first four chapters of the second *maqāla* (section) offer a good illustration of this particular way of paraphrasing and reworking. Indeed, in these chapters Ibn Sīnā develops what Hasnawi has qualified as a "petit traité", a small treatise on change.<sup>3</sup> It is essentially and largely based on Aristotle's *Physics*, III, 1-3, but it also uses elements derived from the latter's V, 1-2; VII, 1 and VIII, 4.<sup>4</sup> Furthermore, change is defined as the "first entelechy of that which potentially is as such [my emphasis]". The qualification of "first" is absent in Aristotle, but it is in full agreement with Themistius' wording. The innovative character of that addition by Themistius is particularly stressed by Philoponus, although it seems to have its ultimate source, at least in inspiration, in Alexander.<sup>5</sup> However, Ibn Sīnā details –much more than his Greek predecessors had done– this double conception of change in direct relation

<sup>1</sup> See Ahmed Hasnawi, "La *Physique* du *Šifāʾ*: aperçus sur sa structure et son contenu", in J. Janssens and D. De Smet (eds.), *Avicenna and His Heritage*, (Leuven: Leuven University Press, 2002), 67.

<sup>2</sup> See Jules Janssens, "L'Avicenne Latin: un témoin (indirect) des commentateurs (Alexandre d'Aphrodise-Thémistius-Jean Philopon)", in R. Beyers, J. Brams, D. Sacré and K. Verrycken (eds.), *Tradition et traduction: Les textes philosophiques et scientifiques au moyen âge latin*, (Leuven: Leuven University Press, 1999), 89-105 (now reprinted in Janssens, *Ibn Sīnā and His Influence on the Arabic and Latin World*, Aldershot, Hampshire: Ashgate, 2006).

<sup>3</sup> This kind of small treatise is somewhat reminiscent of the late Hellenistic "corollaries", e.g., those of Philoponus and Simplicius, in spite of significant differences in the basic approach. It may be worthwhile to note that Ibn Sīnā offers, after the "treatise" on change, one on place (chapters 5-9) and another on time (chapters 10-13) in the second section of the book *al-Samāʿ al-ṭabīʿī*.

<sup>4</sup> See Hasnawi, "La *Physique* du *Šifāʾ*", 67-68; see also the references in the notes of the critical edition of the *Physics* 2 of the *Avicenna Latinus* in S. Van Riet, J. Janssens and A. Allard (eds.), *Avicenna Latinus: Liber primus naturalium, Tractatus secundus, De motu et de consimilibus*, (Brussels: Académie Royale de Belgique, 2006), 147-213.

<sup>5</sup> For Ibn Sīnā's dependence on Themistius and Philoponus, see Janssens, "L'Avicenne Latin: un témoin (indirect) des commentateurs", 97-99; regarding Alexander as the ultimate source of inspiration, see Hasnawi, "Alexandre d'Aphrodise vs. Jean Philopon: Notes sur quelques traités d'Alexandre 'perdus' en grec, conservés en arabe", *Arabic Sciences and Philosophy*, 4 (1994), 63-66.

to a double notion of perfection.<sup>6</sup> Finally, one finds ideas that in all likelihood are proper to him, such as the distinction between time and the element “in which” of change, or the acceptance of change not only in the three categories of quantity, quality and *ubi* but also in that of *situs* (*wadʿ*).<sup>7</sup>

Were these chapters of Ibn Sīnā's *Samāʿ* read by later thinkers in the Islamic world? Did the newly expressed ideas receive attention or even approval? When looking at the so-called world of the “Islamic East”, the answer is definitely positive, as I will try to show in what follows. In this respect, I will consider four important thinkers: Bahmanyār b. Marzubān, a direct disciple of Ibn Sīnā; Abū l-ʿAbbās al-Lawkarī, possibly a disciple of Bahmanyār, but at least a second or third generation disciple of Ibn Sīnā; Fakhr al-Dīn al-Rāzī (twelfth century), a great “theologian and exegete” and a “commentator” of Ibn Sīnā<sup>8</sup>; and Mullā Ṣadrā al-Shīrāzī (sixteenth-seventeenth century), a major representative of the Ishrāqī school of Iṣfahān. For each of them, I have limited myself to one of their major writings: respectively, *Kitāb al-taḥṣīl*, *Bayān al-ḥaqq bi-ḍamān al-ṣidq*, *al-Mabāḥiṭh al-mashriqiyya* and *al-Asfār al-arbaʿa*, specifically the seventh *Marḥala* of the first *Safar*.<sup>9</sup> I will discuss them each in chronological order.

<sup>6</sup> See the seminal study by Hasnawi, “La définition du mouvement dans la *Physique* du *Šifāʿ* d'Avicenne”, *Arabic Sciences and Philosophy*, 11 (2001), 219-255.

<sup>7</sup> For the first idea, see Abū ʿAlī Ḥusayn b. ʿAbd Allāh b. ʿAlī Ibn Sīnā, *al-Shifāʿ*, *al-Samāʿ al-ṭabīʿī*, (ed. S. Zayed; Cairo: al-Hayʾa al-Miṣriyya al-ʿĀmma li l-Kitāb, 1983), 87, 5; for the second, *ibid.*, 103, 8-106, 3. In what follows, all references are to this edition. According to Fakhr al-Dīn al-Rāzī, al-Fārābī was the very first thinker to include change in the category of *situs*, but his opinion is based on a work the ascription of which to the latter is not certain: see *infra*, pp. 28-29.

<sup>8</sup> This qualification of al-Rāzī was inspired by the title of the work of Roger Arnaldez, *Fakhr al-Dīn al-Rāzī: Commentateur du Coran et philosophe*, (Paris: Vrin, 2002).

<sup>9</sup> The following editions were used: for Bahmanyār's *Kitāb al-taḥṣīl*, the edition by M. Muṭahharī; edited Tehran: Tehran University Press, 1970, reprinted Tehran: Intishārāt Dānishgāh-i Tehrān, 1375 H.S.; for al-Rāzī's *al-Mabāḥiṭh al-mashriqiyya*, the anonymous edition of Qom: M. Amīr, 1411 H. (perhaps a reprint of the Hayderabad, 1924-1925 edition); for Mullā Ṣadrā's *al-Asfār al-arbaʿa*, the edition in nine volumes by R. Luṭfī; Qom: Manshūrāt al-Muṣṭafāwī, 1958-1969. As for the *Physics* of al-Lawkarī's *Bayān al-ḥaqq bi-ḍamān al-ṣidq*, it is still wait-

Bahmanyār b. Marzubān had an important number of epistolary exchanges with Ibn Sīnā; he appears to be one of the latter's favorite disciples, if not the most loved one, in spite of his having been severely reprovved on occasion by his master.<sup>10</sup> The composition of his *Kitāb al-taḥṣīl*, in all likelihood, has to be dated after Ibn Sīnā's death. In this work, it is obvious that he draws heavily upon Avicennian texts, especially in using quotations and/or paraphrases of different parts of *Kitāb al-shifāʾ*. However, an in-depth analysis of the structure of the work shows a profound rupture from the major ideas and/or structural *démarches* of his master. He clearly rejects some of the latter's most important innovations, and he thereby at least gives the impression that he wants to restore a more genuinely Aristotelian thought.<sup>11</sup>

Let us now examine whether this rather general characterization applies as well to the exposé on change. The latter is presented in the twelfth chapter of the second part (*maqāla*) of book (*kitāb*) two, which is entitled *mā baʿd al-ṭabīʿa*, meta-physics. The second section is devoted to the discussion of the nine categories of accidents. The twelfth chapter opens with a brief discussion of the categories of action and passion.<sup>12</sup> After this short introductory section, motion becomes the central issue until the end of the chapter. Attention is paid

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ing to be edited, hence, I have consulted the manuscript; Paris, Bibliothèque Nationale, 5900.

<sup>10</sup> See David C. Reisman, *The Making of the Avicennan Tradition: The Transmission, Contents, and Structure of Ibn Sīnā's al-Mubāḥathāt (The Discussions)*, (Leiden: Brill, 2002), 185-195 (epistolary exchange) and Yahya M. Michot, "La réponse d'Avicenne à Bahmanyār et al-Kirmānī: Présentation, traduction critique et lexique arabe-français de la *Mubāḥathā* III", *Le Muséon* 110 (1997), 146 and 162 (beloved disciple) and 189-191 (reprove); see also id., *Ibn Sīnā: Lettre au Vizir Abū Saʿd*, (Beirut: al-Burāq, 2000), *Introduction, passim*.

<sup>11</sup> For a more detailed justification of the preceding affirmations, see Janssens, "Bahmanyār b. Marzubān: A Faithful Disciple of Ibn Sīnā?", in David C. Reisman, with the assistance of Ahmed H. al-Rahim (eds.), *Before and After Avicenna: Proceedings of the First Conference of the Avicenna Study Group*, (Leiden: Brill, 2003), 177-197, and Janssens, "Bahmanyār, and His Revision of Ibn Sīnā's Metaphysical Project", *Medioevo*, 32 (2007), 99-117. For a different appreciation (although certainly not a rejection) of Bahmanyār's reworking, see Heidrun Eichner, "Dissolving the Unity of Metaphysics: From Fakhr al-Dīn al-Rāzī to Mullā Ṣadrā al-Shīrāzī", *Medioevo*, 32 (2007), 155-156, esp. note 20.

<sup>12</sup> Bahmanyār, *Kitāb al-taḥṣīl*, 417-418, 10.

to its definition, its relationship to the different categories, and its opposition to rest. It is evident that for Bahmanyār, change belongs in an essential way to the category of passion. He may have been inspired in this case by Ibn Sīnā's affirmation in his *Samā*<sup>c</sup> that change has to be placed in the category of passion, at least if one wants to limit the number of categories, as Aristotle had done, to ten. However, it is clear that in al-Shaykh al-ra'īs' eyes, this is not the only (and likely not the best) solution. In fact, he clearly suggests that it is better to conceive of change as a separate category in itself.<sup>13</sup> A general outline regarding the derivations from Ibn Sīnā's *Samā*<sup>c</sup>, II, 1-4, either by way of quotation or paraphrase (a question mark indicating a rather casual correspondence), is presented in the following list:

<i>Kitāb al-taḥṣīl</i>	<i>al-Shifā</i> <sup>?</sup> , <i>al-Samā</i> <sup>c</sup> <i>al-ṭabī</i> <sup>ī</sup>
418, 14-16 418, 17-419, 1	81, 10; 81, 15-82, 7 (change and gradual passage from potency into act) 82, 3-7 (to define change by time is impossible, because circular)
419, 2-420, 4	84, 10, 13-19 (change and the "middle")
420, 5-10 420, 11-14	86, 7 (?) (a moment in change only exists in potency) 84, 1-4 (in its quality of completed process, i.e., in its second perfection, change has no real existence)
420, 15-421, 8	85, 8-87, 4 (?) (change as having parts in potency)
422, 1-2	84, 1-2 (change is intelligible)
422, 3-7	85, 1-6 (change in time: a double interpretation)
422, 8-423, 13	86, 15 (?) (a body as something stable to which change happens)
423, 14-15	87, 5 (enumeration of six elements that characterize change)

<sup>13</sup> See Ibn Sīnā, *al-Shifā*<sup>?</sup>, *al-Samā*<sup>c</sup> *al-ṭabī*<sup>ī</sup>, II, 2, 97.

424, 1-12	90, 15-92, 1 (the link between change and its <i>termini a quo</i> and <i>ad quem</i> )
424, 13-425, 1	92, 7-10, 5 (the distinction between change, being in change and the action of changing is purely conceptual)
425, 3-12	94, 17-95, 6 (against the opinion that change is a homonym <sup>14</sup> )
425, 13-426, 7	95, 8 (?) (change necessarily requires the existence of an external cause)
426, 8-427, 6	98, 10-17 (no change in the category of substance)
429, 11-430, 3	108, 14-109, 6 (how are rest and change related to each other?)
430, 4-7	110, 16-17 and 108, 10 (definition of rest as privation of change)

In addition, one finds a few passages that ultimately have been inspired by the *Najāt*:<sup>15</sup>

<i>Kitāb al-taḥṣīl</i>	<i>al-Najāt</i>
421, 9-19	204, 7-205, 2 (100) (definition of change)
427, 7-429, 10	205, 8-208, 8 (105-107) (change and categories other than substance)
430, 8-431, 10	208, 13-210, 3 (107-108) (something in rest is in potency a change)

Even this rather rough survey makes it clear that Bahmanyār covers almost all the essential elements of Ibn Sīnā's small treatise on change in the *Samā'*. However, he systematically omits all historical

<sup>14</sup> Yaḥyá (Philopon) ascribes this opinion to Alexander of Aphrodisias; see Yaḥyá (Philoponus), *Sharḥ al-Ṭabī'a*, in 'A. Badawī (ed.), *Aristūṭālīs, al-Ṭabī'a: Tarjama Ishāq b. Hunayn*, (Cairo: al-Hay'a al-Miṣriyya al-Āmma li l-Kitāb, 1984), I, 176, 5.

<sup>15</sup> All references here, and later as well, are to the edition by Dānish-Pazhūh, Tehran: Intishārāt Dānishgāh-i Tehrān, 1364 H.S. (between the brackets the corresponding pagination of the Cairo, 1938 edition has been added because this latter edition is easier to find).

or doxographical references, although they occupy a not negligible part of his master's work.<sup>16</sup> However, it has to be noted that this attitude might have been inspired by Ibn Sīnā's so-called "Oriental" project, which mainly consisted of a systematic presentation of his philosophy that explicitly avoids historical considerations.<sup>17</sup> Less understandable, however, is the extremely slight attention that is paid to the distinction between two conceptions of change that were amply elaborated in the first chapter of the *Samāʿ*: change as a finished process and change as an ongoing process.<sup>18</sup> Certainly, Bahmanyār does not reject that distinction, but he mentions it so briefly that it can easily escape the reader's attention. In a similar vein, he mentions only in passing his acceptance of change in the category of *situs*, as if it were a long-standing, classical idea. Of course, in these cases, one has to admit that he remains faithful to Ibn Sīnā's basic ideas and gives them less attention than they had received in the latter's work. However, regarding Bahmanyār's analysis, much more is involved than just a difference in emphasis. Indeed, to discuss the issue of change in the context of metaphysics, not of physics, is not only surprising, from an Avicennian point of view, but also totally unacceptable. It blurs the distinctive domains of the two philosophical sciences, a distinction that was very clear to Ibn Sīnā.<sup>19</sup> Moreover, it provides, at least in principle, a way to include in a metaphysical context the argument of the Unmoved Mover as a valid proof for the existence of God, whereas Ibn Sīnā had vehemently rejected the validity of this *démarche*.<sup>20</sup> If the differences with Ibn Sīnā were rather limited

<sup>16</sup> For the place of doxographies in Ibn Sīnā's scientific works, see Janssens, "Ibn Sīnā: An Extraordinary Historian of the Sciences", in M. Mazak and N. Özkaya (eds.), *Uluslararası İbn Sīnâ Sempozyumu –Bildiriler– 22-24 Mayıs 2008, İstanbul [International Ibn Sīnâ Symposium –Papers– May, 22-24, 2008, İstanbul]*, (Istanbul: İstanbul Büyükşehir Belediyesi Kültür A. Ş. Yayınları, 2009), II, 83-93; Turkish translation by O. Baş, *ibid.*, II, 94-103.

<sup>17</sup> See Dimitri Gutas, "Avicenna's Eastern ("Oriental") Philosophy, Nature, Contents, Transmission", *Arabic Sciences and Philosophy*, 10 (2000), 159.

<sup>18</sup> Hasnawi, "La définition du mouvement dans la *Physique* du *Şifā'* d'Avicenne", highlights this distinction very well, which he articulates in French by using the (innovative) terms "mouvement-parcours" and "mouvement-intermédiaire".

<sup>19</sup> See Janssens, "Bahmanyār b. Marzubān: A Faithful Disciple of Ibn Sīnā?", 181-183.

<sup>20</sup> Ibn Sīnā, *Kitāb al-inṣāf: Sharḥ Kitāb ḥarf al-lām*, in ʿA. Badawī (ed.), *Aristū ʿinda l-ʿArab*, (Kuwait: Wakālat al-Maṭbūʿāt, first edition 1947, second edition 1978), 23-24. It has to be noted that it is not certain that Ibn Sīnā considered Aris-

on the level of the contents proper (i.e., mainly restricted to a difference in accentuation), this is no longer the case with respect to the place of motion within the broader system. Here, an important rupture shows itself, insofar as change is dislocated from physics to metaphysics.

As for al-Lawkarī, he not only respects the letter of Ibn Sīnā's exposé (even more than Bahmanyār had ever done, as he quotes verbatim, or almost verbatim, entire pages of the *Samā'*) but he also maintains the treatment of change within the framework of physics proper. Although there are a few very minor omissions, there is also a major one: that of the entire second chapter of the *Samā'* in which Ibn Sīnā explains the presence or absence of change in the different categories. The details of the latter are offered in the third chapter. Hence, al-Lawkarī may have judged the second chapter somewhat superfluous. Thus, after all, he offers a shortened version of Ibn Sīnā's treatise on change, which largely respects the latter's spirit.

The correspondences between al-Lawkarī's and Ibn Sīnā's discussions are as follows:

<i>Bayān al-ḥaqq</i>	<i>al-Sbifā'</i> , <i>al-Samā' al-ṭabī'i</i>
20v, l. 10-21r, l. 5	81, 7-82, 4 (change and the gradual passage from potency to act)
21r, l. 5-19	82, 9-83, 4 (the true definition of change)
21r, l. 19-22r, l. 12	83, 17-85, 6 (the double notion of change; discussion of a problem linked with the notion of change as a completed process)
22r, l. 12-25v, l. 7	98, 9-99, 16; 100, 16-102, 8; 102, 16-103, 8; 104, 2-17; 103, 14-104, 1; 104, 18-105, 8; 106, 7-107, 14 (change and the diverse categories)

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tote himself "guilty" of such a mistaken view. It looks as if he reproaches him for a lack of precision in his *Metaphysics*. However, one has the impression that he thought that the Stagirite correctly pronounced himself in the (pseudo-) *Theology*. If this is correct, then he never seriously doubted the attribution of this work to Aristotle.



25v, l. 8-26v, l. 6	87, 5-88, 11 (enumeration of the six elements that characterize change; significance of the mover; impossibility of the existence of a self-moving being)
26v, l. 6-27r, l. 11	90, 15-91, 5; 91, 10-92, 3 (change and its <i>termini a quo</i> and <i>ad quem</i> )
27r, l. 11-15	92, 13-16 (change and that in which it is)
27r, l. 18-28v, l. 21	108-111, 1 (relation between change and rest)

On the one hand, some omissions can easily be detected. The major one (i.e., that of the entirety of Chapter Two) has already been noted. The other ones are rather limited in scope and never concern crucial issues. Illustrative in this sense is the omission of *Samā'*, 88, 15-90, 15. This passage deals with a purely hypothetical objection regarding rest and what is self-moving (but, in fact, nothing is self-moving). At first sight, more significant is al-Lawkarī's silence concerning the fact that the category of *state* (*jidda*) does not allow for change, but it seems probable that this results from an involuntary oversight.

On the other hand, two major relocations show up:

1. The passage covering p. 104, 2-17 of the *Samā'* precedes the fragment given there (p. 103, 14-104, 1). This clearly constitutes a minor change of order because it concerns two passages that are part of the discussion of the existence of change in the category of *situs* (*wad'*).

2. Pages 87-92 of the *Samā'* are reproduced only after the almost complete reproduction of Chapter Three. In doing this, al-Lawkarī completely separates the discussion of the constitutive elements of change from the elaboration of its definition. Hence, a more important modification is involved here. Nevertheless, because he maintains the same wording, it is of little or no relevance, doctrinally speaking.<sup>21</sup>

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<sup>21</sup> It is worthwhile to note that Hasnawi, "La définition du mouvement dans la *Physique* du *Šifā'* d'Avicenne", does not include the discussion or the translation of this part of the first chapter and thus suggests that it does not have an intimate link with the former discussion of change.

Finally, a small addition (f. 27r, 15-17) has to be mentioned. It deals with the notion of time, but in a very superficial way. Moreover, its presence here is fitting because time is explicitly mentioned by Ibn Sīnā as one of the six elements that characterize change. It is rather surprising that Ibn Sīnā no longer makes any mention of it in his discussion of change (of course, he deals extensively with time in chapters 10-13).

In sum, al-Lawkarī does not modify Ibn Sīnā's basic options or ideas in any way. He shows a great respect for the spirit of the latter's thought and even remains largely faithful to the letter of his exposé. One could easily have believed that one was dealing with a copyist of *Samāʿ*, II, 1, 3 and 4, if it had not been for the few omissions and rearrangements in the textual order.

As for Fakhr al-Dīn al-Rāzī's *al-Mabāḥiṭh al-mashbriqiyya*, it is a vast encyclopedic work that shows many traces of Avicennian influence, even if it is undeniable that it also entails criticisms against Ibn Sīnā.<sup>22</sup> It is divided into three books. The "treatise" on motion of *Samāʿ*, II, 1-4, has been integrated (with rewordings and criticisms) in the fifth section (*fann*), entitled "On motion and time", of the first major part (*jumla*) of the second book. This means that it is included in the wider context of the discussion of the "principles" (*ahkām*) of substances and accidents (the subject of the second book), and more particularly of accidents (the proper object of the first major part). In other words, the overall context (i.e., the discussion of the ten categories) is logical. In spite of this, al-Rāzī does not hesitate to include issues that Ibn Sīnā had designated as belonging to the domain of physics. Hence, just as Bahmanyār had done before him, he weakens the demarcation lines between the domains of logic and physics. In spite of this (and like Bahmanyār), he is not reluctant to draw upon the exposé of the al-Shaykh al-raʿīs, as is shown by the following table of comparison (a question mark again indicates a casual correspondence):

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<sup>22</sup> Regarding a critical evaluation in this respect, see Janssens, "Ibn Sīnā's Impact on Fakhr al-Dīn al-Rāzī's *al-Mabāḥiṭh al-Mashbriqiyya*, with Particular Regard to the Section entitled *al-Ilābiyyāt al-maḥḍa*: An Essay of Critical Evaluation", *Documenti e Studi sulla Tradizione Filosofica Medievale*, 20 (2010; in press).

<i>al-Mabāḥiṭh al-mashriqiyya</i>	<i>al-Shifāʿ, al-Samāʿ al-ṭabīʿī</i>
547, 10-15 potency to act)	81, 7-10 (gradual passage from
547, 17-548, 6 nition of change)	82, 3-7 (mistaken circular defi-
548, 7-19 change)	82, 9-17 (proper perfection of
548, 20-549, 7 potencies –definition of change <sup>23</sup> )	82, 19-83, 6 (evocation of two
549, 7-10 tions of change, i.e., as inequality and alteration <sup>24</sup> )	83, 7 and 11 (improper defini-
550, 13-551, 8 of change)	83, 18-84, 16 (a double concept
551, 9-15	85, 5-7 (change in time)
551, 9-554, 14 (change as both imaginary and real, universal and particular: an inter- rogation)	84, 18-85, 14 and 86, 7-20 (?)
554, 14-16	87, 5 (six elements of change)
554, 18-555, 19 moving being)	88, 5-11 (impossibility of a self-

<sup>23</sup> Although the definition as given by al-Rāzī (549, 7) includes the qualification of the perfection of what is in potency as “primary”, he attributes it to Aristotle. However, that qualification is a later addition: see supra, p. 16, especially note 5. It has to be noted that al-Rāzī entirely partakes of Ibn Sīnā’s double notion of change, even if he never explicitly mentions that of “second perfection” (at least if I have not overlooked it).

<sup>24</sup> al-Rāzī assigns these definitions to Plato and Pythagoras, respectively. This specification is lacking in the corresponding passage of *Samāʿ*. Regarding the Pythagoreans as adepts of a conception of change in terms of alteration, see Yahyá, *Sbarḥ al-Ṭabīʿa*, I, 184, 16. As for Plato, he is mentioned (together with the Pythagoreans) in *Aetius Arabus* as belonging to the thinkers who have defined change in terms of inequality (but expressed by the notion of *ikbtīlāf wa tagbay-yur*; not *khurūj ʿan al-musāwāt*): see Hans Daiber, *Aetius Arabus: Die Vorsokratiker in arabischer Überlieferung*, (Wiesbaden: Franz Steiner, 1980), 132-133 (I, 23, 1).

555, 20-561, 5	87, 6-88, 11 (?) (impossibility of a self-moving being –remarks and objections)
561, 6-562, 3	90, 15-91, 5 ( <i>termini a quo</i> and <i>ad quem</i> in change)
562, 4-16	91, 16-18 ( <i>termini a quo</i> and <i>ad quem</i> in circular change)
562, 17-563, 18	90, 17-91, 2 (?) (opposition between <i>termini a quo</i> and <i>ad quem</i> in change)
563, 19-564, 4	93, 4-94, 15 (?) (link between change and the categories)
564, 5-18	94, 17-95, 8 (proof that no category is subject to change)
566, 4-15	93, 8-94, 5 (proof that no category is a genus of change)
567, 4-20	96, 1-10 (change: equivocal or univocal?)
568, 1-569, 7	93, 5-6; 95, 10-96, 1; 96, 11-17 et 96, 11 (change and the category of passion)
569, 9-10	107, 16-17 (change is present in four categories)
575, 12-17	102, 12-16 (kind of opposition suffices to qualify growth and diminution as change in the category of quantity)
581, 22-582, 19	103, 4-5; 103, 11-104, 10 (change in the categories of <i>ubi</i> and <i>situs</i> )
588, 18-591, 9	98, 9-101, 7 (no change in category of substance <sup>25</sup> )
593, 2-594, 12	102, 11-12; 103, 5-8; 106, 4-5 and 106, 17-107, 5 (categories besides that of substance having no change <sup>26</sup> )

<sup>25</sup> al-Rāzī divides Ibn Sīnā's text in a way that is not present in the original, but nevertheless is doctrinally tenable.

594, 13-595, 21

108, 10-11 and 109, 7-110,  
19 (rest)

Generally speaking, al-Rāzī paraphrases rather than reproduces Ibn Sīnā's text. One rarely finds literal quotations, as was the case with al-Lawkarī. Like Bahmanyār, al-Rāzī does not hesitate to reformulate Ibn Sīnā's thought. However, contrary to the latter, he explicitly indicates those cases where he expresses fundamental additions, investigations and/or criticisms. Certainly, a good number of them are limited in scope, and therefore most of the time they do not exceed a few lines. Nevertheless, they sometimes reveal themselves to be substantial, as the following three cases may illustrate:

1. While discussing the problem of the origination of a thing in terms of gradual change on pages 549, 1-550, 12, al-Rāzī inclines toward an eleatic conception of change –a conception that is substantially different from that of Ibn Sīnā's.<sup>27</sup>

2. On pp. 564, 19-566, 3, al-Rāzī emphasizes that qualitative change implies a quantitative aspect. I looked in vain for this kind of affirmation in Ibn Sīnā. Hence, in all likelihood this has to do with an innovative development of al-Rāzī, although this in no way contradicts Ibn Sīnā's basic conception of the general link between the categories and change.

3. On pp. 591, 10-593, 2, the presence of a succession of moments in a qualitative change is defended in a way that seems to be absent in Ibn Sīnā. In this respect, al-Rāzī does not hesitate to put into service a passage derived from *al-Shifāʾ*, *Kitāb al-naḥs*, III, 5.<sup>28</sup>

Moreover, on three occasions (pp. 569, 11-575, 19, change in the category of quantity; pp. 575, 20-581, 18, change in the category of

<sup>26</sup> For four of these categories, al-Rāzī also utilizes passages taken from *al-Najāt*, 205, 13-15 (106) (relation); 206, 3-5 (106) ("quando") and 207, 12-208, 5 (107) (action and passion).

<sup>27</sup> Regarding al-Rāzī's inclination toward a non-dynamic, eleatic conception of change, see Arnaldez, *Fakhr al-Dīn al-Rāzī*, 181.

<sup>28</sup> See Ibn Sīnā, *al-Shifāʾ*, *Kitāb al-naḥs*, (ed. F. Rahman; London: Oxford University Press, 1959), III, 5, 117, 9-118, 4. In this passage, Ibn Sīnā insists that, due to their extreme shortness, the difference between the time of perceiving a nearby object and the time of perceiving a distant one cannot be perceived by the senses, although the latter can be divided into infinite parts, one of which corresponds to the time to perceive the nearby object.

quality; and pp. 582, 20-588, 17, absence of change in the category of substance), al-Rāzī's exposé is substantially different from that in *Samā*<sup>c</sup>. However, another book from *Kitāb al-sbifā*<sup>7</sup> treating issues in natural philosophy (*al-Kawn wa l-fasād*) has clearly functioned as a major source.<sup>29</sup>

Generally speaking, al-Rāzī offers a valuable idea of what is said in *Samā*<sup>c</sup>, II, 1-4. He presents a genuine survey of Ibn Sīnā's major ideas, making them his own most of the time, although not always. Two of the most significant among the latter, the double notion of change and the presence of change in the category of *situs*, are not only accepted, but also well developed. In this respect, he remains even closer to Ibn Sīnā's thought than Bahmanyār had done. Certainly, he also opposes Ibn Sīnā on some issues. Like Bahmanyār (though in a different way), he does not respect the basic division of the sciences as elaborated by Ibn Sīnā. Furthermore, even when he agrees with Ibn Sīnā, he does not always explicitly say so. On the contrary, although it happens now and then, it does so only rarely. At any rate, he gives proof of being a careful reader of the latter's work(s). His critical sense also shows itself in his remark that al-Fārābī (hence, not Ibn Sīnā) was the first thinker who accepted change in the category

<sup>29</sup> A quick survey revealed the presence of a direct influence of this work on the chapter on growth (pp. 573, 4 sqq. –inspired by Chapter 8 of *Kawn*), on the entire exposé of change in the category of quality (with special attention to *kalām* doctrines, especially the notion of *kumūn* –inspired by *Kawn*, Chapter 4) and on that of the absence of change in substance (intellectual and observational proofs –inspired by *Kawn*, Chapter 6). A more systematic investigation is needed to fix the precise details of this influence, but it exceeds the limits of the present paper. The passage on p. 588, 11-17, however, deserves special attention, because al-Rāzī explicitly qualifies it as a saying of *al-Shaykh al-ra'is*. It presents the example of the “bottle with the long neck”, called in Arabic *qumquna*, in the context of the discussion of the transformation of water into air. This passage might have been inspired by Ibn Sīnā, *Dānish-nāmeḥ, Ṭabī'iyāt*, (ed. M. Meshkāt; Tehran: Intishārāt Anjuman-i Āthār-i Millī, 1953; repr. Hamadān: Dānishgāh-i Bū 'Alī Sīnā, 2004), 55, 6-56, 8, although the wording is far from identical. A more correct rendering of the latter is offered by Abū Ḥāmid Muḥammad b. Muḥammad al-Ghazālī, *Maqāṣid al-falāsifa*, (ed. S. Dunyā; Cairo: Dār al-Ma'ārif, 1960), 327-328, to which one may compare Abū l-Faṭḥ Ṭājj al-Dīn Muḥammad b. 'Abd al-Karīm al-Shahrastānī, *Kitāb al-Milal wa l-niḥal*, (ed. W. Cureton; London: n.p., 1842-1846), 409 [reference borrowed from Jolivet, in al-Shahrastānī, *Livre des religions et des sectes*, (traduction avec introduction et notes par J. Jolivet et G. Monnot; Paris: UNESCO, 1993), II, 458, note 84].

of *situs*.<sup>30</sup> He bases this, however, on a small passage in the work *ʿUyūn al-masāʿil*, where it is said: “The motions of the Heavens are according to *situs* (and) circular”.<sup>31</sup> The work was undoubtedly attributed to al-Fārābī in the manuscript that he had at his disposal. Although the authenticity of this attribution can be questioned, it is not totally implausible, and so al-Rāzī’s remark is not necessarily devoid of sense, even if its historical accuracy is not evident.<sup>32</sup> Whatever the case, al-Rāzī exclusively bases the further development of this idea on Ibn Sīnā’s exposé. It is therefore beyond question that al-Rāzī, at least in his *Mabāḥith*, found in Ibn Sīnā a major source of inspiration.

Separated by almost four centuries from al-Rāzī, Mullā Ṣadrā al-Shīrāzī, the great master thinker in the Illuminationist (*Isbrāqī*) tradition in Īrān, discussed in his monumental work *al-Asfār al-arbaʿa* (more precisely, in the seventh stage (*marḥala*) of the first “journey” (*saḡar*) a theory of change more or less corresponding with *Samāʿ*, II, 1-4.<sup>33</sup> This first “journey” deals with the nature of being and its major accidents, which is a quite natural (and hence adequate) context for the discussion of change, at least when one takes into account the specific framework of Illuminationist philosophy. Certainly, this deviates in many important respects from the “classical” Aristotelico-Avicennian system. However, this does not mean that Mullā Ṣadrā completely ignores Ibn Sīnā. Even if he does not often quote him directly, he nevertheless was influenced by the latter’s thought, showing a great familiarity with its major aspects. Mullā Ṣadrā’s under-

<sup>30</sup> al-Rāzī, *Mabāḥith*, 582, 17-19.

<sup>31</sup> Abū Naṣr Muḡammad b. Muḡammad b. Ṭarkhān al-Fārābī, *ʿUyūn al-masāʿil*, (ed. F. Dieterici, in id., *Alfārābī’s philosophische Abhandlungen*, Leiden: Brill, 1890), 60, 16.

<sup>32</sup> See Fazlur Rahman, *Prophecy in Islam: Philosophy and Orthodoxy*, (London: Allen & Unwin, 1958; reprint, Chicago & London: The University of Chicago Press, 1979), 21-22, n. 2; see also Janssens, “The Notions of *Wāḡib al-ṣuwar* (Giver of Forms) and *Wāḡib al-ʿaql* (Bestower of Intelligence) in Ibn Sīnā”, in M. C. Pacheco and J. F. Meirinhos (eds.), *Intellect et Imagination dans la Philosophie Médiévale* (Actes du XI<sup>e</sup> Congrès International de Philosophie Médiévale de la SIEPM. Porto, du 26 au 31 août 2002), (Turnhout: Brepols, 2006), 559. However, Joep Lameer, *Al-Fārābī and Aristotelian Syllogistics: Greek Theory and Islamic Practice*, (Leiden: Brill, 1994), 24-25, accepts its ascription to al-Fārābī and offers two arguments in this sense (but he ignores Rahman’s objections).

<sup>33</sup> See Mullā Ṣadrā al-Shīrāzī, *al-Asfār al-arbaʿa*, III, 20-115.

standing of Ibn Sīnā's doctrine owes a considerable debt to his careful reading of the *Mabāḥith* of al-Rāzī. Therefore, among the sources of his exposé on change, mention has to be made of both Ibn Sīnā's *al-Samā' al-ṭabī'ī* and al-Rāzī's *al-Mabāḥith al-mashbriqiyya*.

<i>al-Asfār al-arba'a</i>	<i>al-Shifā'</i> , <i>al-Samā' al-ṭabī'ī</i> or <i>al-Mabāḥith al-mashbriqiyya</i>
21, 1-23, 4	<i>Mabāḥith</i> 547, 10-548, 6 (potency/act)
23, 5-6 change)	<i>Samā'</i> 82, 7-8 (circular definition of
23, 6-25, 8 definitions of change <sup>34</sup> )	<i>Mabāḥith</i> 548, 7-549, 10 (mistaken
25, 9-26, 9 change by the ancients <sup>35</sup> )	<i>Samā'</i> 83, 5-14 (three definitions of
26, 17-27, 18	<i>Mabāḥith</i> 549, 11-550, 12 (interrogation expressed by al-Rāzī regarding gradual change)
30, 14-18 as "passage" is an erroneous opinion)	<i>Samā'</i> 83, 14-17 (to conceive change as
31, 6-32, 8 of change)	<i>Samā'</i> 83, 18-84, 19 (?) (double notion
32, 9-15	<i>Mabāḥith</i> 551, 9-15 (change in time)
36, 5-37, 1 containing divisible parts)	<i>Mabāḥith</i> 552, 3-11 (change as containing
41, 1-46, 16	<i>Mabāḥith</i> 554, 18-555, 16; 555, 20-557, 11 and 557, 21; 558, 1-18; 559, 14-21 (every mobile has a motor)

<sup>34</sup> With al-Rāzī, Mullā Ṣadrā presents Plato and the Pythagoreans as the authors of two mistaken definitions of change, i.e., those of inequality or alteration (compare supra, note 24).

<sup>35</sup> Mullā Ṣadrā, who quotes here literally from Ibn Sīnā, mentions the three opinions on change that Aristotle, *Physics*, III, 2, 201 b 20-21, had qualified as utterly mistaken: change as alterity, as inequality or as non-being. This fragment partly overlaps the previous one (largely corresponding with al-Rāzī's *Mabāḥith* 548, 7-549, 10), because the former two of these three doctrines were already dealt with there. The only reason that I can see for the direct use of Ibn Sīnā's text is the presence in it of a third view, although that is also a mistaken one.



69, 5-72, 5	<i>Mabāḥiṭh</i> 563, 19-564, 26 and 565, 14-566, 1 (nature of link between change and categories)
74, 6-75, 9	<i>Samā</i> <sup>c</sup> 93, 8-9, 13-14 and 5 (change: a homonymous notion?)
75, 13-14	<i>Samā</i> <sup>c</sup> 87, 5 (six elements of change)
75, 16-76, 5	<i>Samā</i> <sup>c</sup> 90, 15-91, 5 ( <i>termini a quo</i> and <i>ad quem</i> of change)
105, 9-106, 4; 107, 1-2, 11-12	<i>Samā</i> <sup>c</sup> 98, 11-18 (against accepting change in the category of substance)

To this, it has to be added that Mullā Ṣadrā, *Aṣfār*, III, p. 29, 6-8, offers an explicit quotation from *Najāt* (p. 203, 10-12 [105]). It consists of a definition of change that omits the qualification of “first perfection”: “(Change) is the gradual transformation of a state established in a body, in such a way that it tends towards something; and it reaches this (latter) in potency or in act”. Afterwards (*ibid.*, pp. 29, 9-30, 13), Mullā Ṣadrā analyzes in detail the different elements of restriction involved in this definition.

Three passages show an evident link with the *Samā*<sup>c</sup>, but closer inspection reveals that their direct source is Bahmanyār's *Kitāb al-taḥṣīl*:

<i>al-Aṣfār al-arbaʿa</i>	<i>Kitāb al-taḥṣīl</i>
27, 19-22	420, 14-16 (non-real existence of change as a process of becoming)
59, 15-16	422, 8-9 (necessity of the existence of a stable thing in view of the possibility of change)
80, 12-18 <sup>36</sup>	428, 1 and 5-14 (existence of change in the categories of <i>ubi</i> and of <i>situs</i> )

Mullā Ṣadrā mentions many elements of Ibn Sīnā's doctrine of change, and agrees with the most typical of them, i.e., the acceptance of a double notion of change and the presence of change in the cate-

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<sup>36</sup> I lack certainty about the exact end of the fragment involved, due to the fact that in the edition at my disposal pages 81-97 are missing. It is obvious that in these pages still more derivations from Ibn Sīnā (or Bahmanyār or al-Rāzī) may be present.

gory of *situs*. However, on other issues he strongly questions, not to say completely rejects, the view of the al-Shaykh al-raʿīs. In this respect, he goes much further than Bahmanyār or al-Rāzī had done before him. He sometimes makes fundamental innovations –for example, when he seriously puts into question the non-real character of change as process. However, his most radical departure from Ibn Sīnā consists in the acceptance of change in a fifth category, i.e., that of substance. He thereby lays the foundations for his famous theory of substantial change. This has been the object of a wide range of interpretations and has given rise to many controversies. However, for our present investigation they are not relevant. The only significant fact is that even if Mullā Ṣadrā develops an entirely new view, he still presents elements of Ibn Sīnā’s exposé –of course, without agreeing with them.

In the preceding sections, we focused on the reception of Ibn Sīnā’s *Physics* in the Eastern part of the Islamic world, or, to be more precise, on a significant part of it: its “small treatise” on change. The results of our survey make it clear that this text has played more than a secondary role in the physical exposés included in the encyclopedic writings of some of the greatest representatives of the Oriental posterity of Ibn Sīnā. One detects not only a respect for the spirit of the original text but also for the letter of the text as well. Such an important and innovative idea as the acceptance of the existence of change in the category of *situs* is never put into question, in sharp contrast with the Latin reception.<sup>37</sup> In spite of deviations or even fundamental rejections of its elements by some of our authors, Ibn Sīnā’s theory evidently remained a most significant source of inspiration.

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<sup>37</sup> Albert the Great, in his *Physica*, V, 1, 7 (ed. P. Hossfeld; Aschendorf: Monasterium Westfalarum, 1988), and Thomas Aquinas, in his *Commentarium in VIII Libros Physicorum*, IV, 7, § 475 (ed. Maggiolo; Taurini: Marietti, 1954) explicitly reject the existence of change in the category of *situs*. However, Robert Grosseteste seems to have accepted it: see his *Commentarius in VIII Libros Physicorum Aristotelis*, (ed. R. C. Dales; Boulder: Colorado, 1963), 83. For further details on the reception of Ibn Sīnā’s *Physics* in the Latin tradition, see Janssens, “The Reception of Avicenna’s *Physics* in the Latin Middle Ages” in I. Vrolijk and J. P. Hogendijk (eds.), *O ye Gentlemen: Arabic Studies on Science and Literary Culture in honour of Remke Kruk*, (Leiden & Boston: Brill, 2007), 55-64. For the historical background of Ibn Sīnā’s acceptance of change in the category of *situs* and its particular significance, see Jon McGinnis, “Positioning Heaven: The Infidelity of a Faithful Aristotelian”, *Phronesis*, 51 (2006), 140-161.

Even five centuries after it was written, the *Samā'* still constitutes a basic work of reference. However, it must be emphasized that this does not mean that our authors blindly relied on it. On the contrary, they did not hesitate to introduce innovations on the level of structure as well as content.

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