It's Raining Calves:
History and sources of a spurious citation from Avicenna in Albert the Great's *Meteorology*

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Abstract

The paper investigates the textual history of a citation attributed by Albert the Great to Avicenna and demonstrates its use, primarily in the debates on spontaneous generation, throughout the Middle Ages and Renaissance.

Key Words

Albertus Magnus, Avicenna, Averroes, Spontaneous Generation, Medieval Meteorology.

In the history of every science, there are exemplary *lapsus* that served as a target for mockery to later generations of scholars, although the intentions of their authors or their exact source were often not taken into consideration. In law studies, such was the case of *ignorantia Accursiana*. Accursius (d. 1263), a famous professor of law at the university of Bologna, who compiled the glosses on the *Code of Justinian*, narrated a tale of how the Romans had got their laws from the Greeks involving a widely spread folklore motif of debating with gestures and implying, inter alia, that the Romans and Greeks discussed the problems of triadology long before Christ's birth.[1] This anachronism caused scornful remarks and heavy criticism from the Renaissance and Enlightenment scholars. Recent scholarship, however, sees a joke or entertainment in this passage.[2] In the present article, I will

[1] *Corpus iuris civilis Iustinianei, cum commentariis Accursii, scholiis Contii, et D. Gothofredi lucubrationibus ad Accursium* (...) *Tomus hic primus digestum vetus continet*, Lugduni 1627, col. 24. I am mostly grateful to Svetlana Kleyner, Remke Kruk, Jean-Marc Mandosio and Vera Tsukanova for their help and comments. I acknowledge support from the RSF grant No. 17-18-01624.

[2] See esp. Giorgia Maragno, « Wie der weise Accursius für einen Narren gehalten wurde: Die Geschichte eines missverstandenen Scherzes », *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte, Romanistische Abteilung*, 132 (2015), p. 499–510, and, with a focus on the wanderings of the motif,

consider a story attributed to Avicenna by Albert the Great that aroused a similar reaction over the centuries that followed.

Despite its significant impact on the scholarly tradition and ample discussions in the Renaissance and Modern literature, this passage from Albert is only occasionally touched upon in recent studies.[3] In order to give a comprehensive account, I will first present the story as it stands in the earliest source known to me and focus on its reception in the subsequent scholarship and literature, and then proceed to an attempt at tracing its origins.

I. *The story*

The earliest instance and the source of the later tradition is Albert the Great, *Meteora*, Lib. 3 Tract. 3 Cap. 20: « Et est digressio declarans, quid est, quod percutit de nube ».[4] In this chapter, Albert addresses the question of what is it that strikes from the cloud – air or vapor, or both, or neither of them. He discusses an opinion that it can be neither air nor vapor because they cannot break more solid bodies while thunder can. Some adduce as evidence that stones, iron and other minerals happen to fall from above, none of which can be produced from vapor.

> Some even say, once a body of a perfect animal such as a calf did fall, although dead.[5]

Albert himself, however, argues that the striking agent (if we may call it so) is either vapor with air or vapor alone, for they should not be considered *per se*, but in a rush and violent motion (*in impetu et violentia*). They are natural transmitters of strike force because they are less resistant to it and receive its energy, as we would say today, with minimal loss. Now, minerals falling from the clouds have nothing to do with the present question, but are explained by the mixed nature of

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Laurence De Looze, « To Understand Perfectly Is to Misunderstand Completely: 'The Debate in Signs' in France, Iceland, Italy and Spain », *Comparative Literature*, 50/2 (1998), p. 136–154.

3 Cf. Hendrik C. D. de Wit, *Histoire du développement de la biologie*, vol. III, trans. Hendrik C. D. de Wit, André Baudière, Presses polytechniques et universitaires romandes, Lausanne 1994, p. 373; Paola Zambelli, *Una reincarnazione di Pico ai tempi di Pomponazzi, con l'edizione critica di Tiberio Russiliano Sesto Calabrese Apologeticus adversus cucullatos (1519)*, Il polifilo, Milano 1994 (Testi e documenti, 6), p. 87–88; Laura A. Smoller, « Of Earthquakes, Hail, Frogs, and Geography: Plague and the Investigation of the Apocalypse in the Later Middle Ages », in Caroline Walker Bynum, Paul Freedman (eds.), *Last Things: Death and the Apocalypse in the Middle Ages*, University of Pennsylvania press, Philadelphia 2000, p. 156–188, at p. 179; Maaike van der Lugt, *Le ver, le démon et la vierge: Les théories médiévales de la generation extraordinaire: Une étude sur les rapports entre théologie, philosophie naturelle et medicine*, Les Belles Lettres, Paris 2004 (L'âne d'or, 20), p. 180.

4 Albertus Magnus, *Meteora*, in Id., *Opera omnia*, vol. VI/1, ed. Coloniensis, p. 171–172.

5 Ibid.: « Aliquando etiam dicitur cecidisse de nube corpus animalis perfecti sicut vituli, licet esset corpus mortuum ». Hereafter all translations are mine if not stated otherwise.

vapors, which is close to the nature of mercury and unpurified sulphur. That is why in most cases it is iron that falls from above, and since it becomes strongly boiled by the fire of the cloud, it falls in the form of the best steel (*chalybs*), and then, when it becomes frozen within the cloud, it distils as drops from inside the vapor and forms a mass as if consisting of millets. The minerals that fall from above are so desiccated that they cannot be liquefied and are not malleable, but being put into fire, evaporate turning into cinders. And here Albert mentions the fall of the calf for the second time:

> However, the bodies of perfect animals are rarely formed in the cloud, although Avicenna says it happened once that the body of a calf fell, and attributes this mostly to the power of the stars imprinting the form of a calf at that time.[6]

I will discuss the role of Avicenna and the genuineness of this attribution later on in this article, but first I will focus on the reception of Albert's passage. In the following section, I will show how the calf story was being transmitted, how and to which ends exploited, which role it played in the subsequent scholarship and how the scholars' attitude changed.

II. *Reception*

The passages from Albert's *Meteora* were reproduced almost *verbatim* in the *Summa naturalium* (otherwise *Philosophia pauperum*) – a popular compilation of Albert's works which used to be attributed to Albert the Great and printed together with his writings, but now is held to be a work by his namesake and later contemporary Albert of Orlamünde, also a Dominican.[7]

The subsequent tradition considered this example predominantly in connection with the theory of spontaneous generation – a topic which I will discuss at length later on in this section. A different attitude was shown only by those authors who, like the chronicler Heinrich von Herford, did not seem to bother much about theoretical issues, or those who, like Franz von Retz, sought only to demonstrate the omnipotence of the Creator who is able to perform such miracles. Given such uniformity, it seems to be pointless to divide the sources into sub-groups according to the use they made of this citation. Instead, I will adduce

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[6] Ibid.: « Corpora autem animalium perfectorum raro formantur in nube, licet hoc semel dicat Avicenna contigisse quod corpus vituli cecidit, et hoc ipse maxime attribuit virtuti stellarum in tempore illo formam vituli imprimentium ».

[7] On the authorship see Bernard Geyer, *Die Albert dem Grossen zugeschriebene Summa Naturalium (Philosophia Pauperum): Texte und Untersuchungen*, Verlag der Aschendorffschen Verlagsbuchhandlung, Münster 1938 (Beiträge zur Geschichte der Philosophie des Mittelalters, 35/1). For the passages in question see in *Alberti Magni Opera omnia*, ed. Borgnet, vol. V, p. 498–499.

them in a chronological order, drawing a line only between the medieval and humanistic periods, although this line is admittedly vague and transparent.

II.1. Medieval tradition

In the sermon on the Eucharist,[8] Armand de Belvézer (d. 1334) draws an analogy between the miraculous transubstantiation and some natural phenomena, such as growing of acorns from a seed, but this parallel is even more closely demonstrated by the power of heaven which converts vapors into another nature – rain, hoarfrost, snow, hail, stones, fire, and sometimes into animals, such as frogs. Albert even says that once a calf fell down with the rain. And if such a conversion could be caused by the celestial material power, all the more powerful is the spiritual might in Christ.

In the *Pretiosa margarita novella*, written about 1330 by Petrus Bonus, the calf quotation is used as an argument against the opponents of alchemy.[9] Among other confirmations, Petrus Bonus provides some analogies and examples to demonstrate the possibility of transformations and transmutations of species. A spontaneous generation naturally related to the generation from a clearly distinct source matter constitutes a perfect parallel to the transmutation of metals. Thus, he says that

> Nature generates frogs in the clouds, either in dust moistened with rain, or by means of putrefaction by the ultimate disposition of a similar substance. Avicenna says that a calf was generated in the clouds with thunder and fell with the rain half alive. And he says that nature makes spontaneous generations in those [cases].[10]

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[8] Armandus de Bello Visu, *Sermones de tempore, et de Sanctis per totum ferè annum declamabiles, e solo psalterio dauidico desumpti, exemplorum praesertim naturalium applicatione, prouerbiorum salibus, ac mirifica vbique eruditione refertissimi*, apud Petrum Mariam Marchettum, Brixiae 1610, p. 292. On its author see most recently Serge-Thomas Bonino, « Autour d'Armand de Belvézer. Le thomisme en France au xive siècle », *Revue des sciences philosophiques et théologiques*, 96/2 (2012), p. 233–267.

[9] On the work and its author, Petrus Bonus, see Lynn Thorndike, *A History of Magic and Experimental Science*, Columbia University Press, New York 1934, vol. III, p. 147–162, who mentions this quotation (p. 162); Eric John Holmyard, *Alchemy*, Dover, New York 1990 (repr. Penguin Books, Harmondsworth 1957), p. 144, criticizes the argument as 'reckless'; cf. also William R. Newman, « Medieval Alchemy », in David C. Lindberg, Michael H. Shank (eds.), *The Cambridge History of Science,* vol. II: *Medieval Science*, Cambridge University Press, Cambridge 2013, p. 397–398. On his use of meteorological treatises see Chiara Crisciani, « Aristotele, Avicenna e *Meteore* nella *Pretiosa Margarita* di Pietro Bono », in Cristina Viano (ed.), *Aristoteles Chemicus. Il IV libro dei 'Meteorologica' nella tradizione antica e medievale*, Academia, Sankt Augustin 2002 (International Aristotle Studies, 1), p. 165–182.

[10] I am deviating from the English translation by Arthur Edward Waite, *The New Pearl of Great Price: A Treatise Concerning the Treasure and Most Precious Stone of the Philosopher. Or the method and procedure of this divine art; with observations drawn from the works of Arnoldus, Raymondus, Rhasis, Albertus, and Michael Scotus*, J. Elliott and co., London 1894, p. 93–94, for the sake of accuracy. The Latin text is after Jean Jacques Manget (ed.), *Bibliotheca chemica curiosa seu Rerum ad alchemiam pertinentium*

He then proceeds to mention other cases of generation from rotten flesh (bees from a calf, wasps from an ass etc.), the formation of minerals in the clouds – thunderstones and burnt iron that cannot be liquefied by fire, but evaporate as smoke and cinders, and cites some historical examples, such as the large iron meteorite that fell near Vergen and was brought to the king Corascenus who ordered to make swords from it, but proved immalleable. He mentions then that the Alamanic swords (*enses Alamanici*) are made from that kind of iron. A similar accident happened in Tepastris (*apud Tepastrem*). In some places water turns into stones, as sometimes also do animals and plants, and a loaf of bread underwent the same transformation near Corascem. These examples ultimately go back to Avicenna's *De mineralibus* (see below).

The calf from the sky occurs in the earliest known manuscript of the commentary on Ps.-Albert's *De secretis mulierum* – however, in a slightly different form.[11] This commented version was the most popular.[12] Here this example is included into the discussion of Avicenna's views on the Flood and the possibility of spontaneous generation of animals who then continue to propagate in a natural way.

thesaurus instructissimus : quo non tantum artis auriferae, ac scriptorum in ea nobiliorum historia traditur; lapidis veritas argumentis & experimentis, vol. II, sumpt. Chouet, G. de Tournes, Cramer, Perachon, Ritter et S. de Tournes, Genevae, 1702, p. 55: « Natura enim generat ranas in nubibus, aut in pulvere asperso pluvia, et per putrefactionem ex ultima dispositione materiae ad hoc propinquae. Et refert Avicenna, quod vitulus in nubibus generatus est cum tonitruis, et cecidit cum pluvia semivivus. Et dicit quod natura in talibus facit subitas generationes ».

[11] MS Utrecht, UB, 723, in the part dated to 1353, see Lynn Thorndike, « Further Consideration of the *Experimenta, Speculum astronomiae*, and *De secretis mulierum* Ascribed to Albertus Magnus », *Speculum*, 30 (1955), p. 413–443, at p. 438–429. Fol. 64r: « Item uero Auicenna posuit quendam vitulum cadere de celo quem dixit fuisse generatum in aere ex putrefactione ». The MS is available online at <http://objects.library.uu.nl/reader/resolver.php?obj=002653865&type=2>.

[12] See Thorndike, « Further Consideration », p. 429. On the various versions of the text with bibliography see Kristian Bosselmann-Cyran, '*Secreta mulierum*' *mit Glosse in der deutschen Bearbeitung von Johann Hartlieb: Text und Untersuchungen*, Wellm, Hannover 1985 (Würzburger medizinhistorische Forschungen, 36), p. 9–19, and Britta-Juliane Kruse, *Verborgene Heilkünste: Geschichte der Frauenmedizin im Spätmittelalter*, De Gruyter, Berlin – New York 1996 (Quellen und Forschungen zur Literatur- und Kulturgeschichte, 5), p. 18–22. This commentary was taken into the first prints of the *Secrets* where the same phrase can be found, cf. Ps.-Albertus Magnus, *De formatione hominis in vtero materno vel vt alij dicunt Secreta mulierum* [...], Johann Koelhoff d.Ä., Köln: ca. 1490, fol. Eiiii^{v}; Id., *De secretis mulierum et virorum*, Johann Froschauer, Augsburg, ca. 1503, fol. Dii^{v}. The original text of the *De secretis mulierum* can be consulted in José Pablo Barragán Nieto, *El 'De secretis mulierum' atribuido a Alberto Magno: estudio, edición crítica y traducción*, FIDEM, Porto 2012 (Textes et études du Moyen âge, 63), p. 326–328; for English translation see Helen Rodnite Lemay (ed.), *Women's Secrets: A Translation of Pseudo-Albertus Magnus' De Secretis Mulierum with Commentaries*, State University of New York Press, Albany 1992, p. 96.

Heinrich von Herford (d. 1370) records in his *Chronicle* under 1346 a monstrous birth of a two-headed lamb and cites three *exempla* explicitly referring to Albert.[13] The first, taken from *Physica* II, 3, 3, is a close analogy to the incident narrated by Heinrich, but the two others – the marvelous rain of frogs and fishes and the calf story – seem to be only loosely connected to the subject. Perhaps, Smoller is right in suggesting that « Heinrich seems to be thinking back to his entry for the previous year about the rain of toads and snakes in the east that preceded the outbreak of plague ».[14] The form of the citation corresponds exactly to the source.

Blasius of Parma (d. 1416) accepts that animals such as a donkey can be generated in the air (*in media regione*) as well as any other animal belonging to an inferior species. In this, he follows Albert's quotation as he refers to the « bull mentioned by Avicenna », which is undoubtedly the same calf to whom this article is dedicated. However, he remarks that the stars cannot give an intellectual soul to the generated form, and for this reason the generation of a man in this way is impossible.[15]

The Article 188 of the Paris condemnations of 1277 which gives the list of erroneous points or statements to be repudiated is directed against the view « that if in any humor such a proportion could be attained by the power of the stars which is in parents' semens, then from that humor a man could be generated, and that a man could be generated from the putrefaction alone ».[16] The anonymous commentary on the condemnations composed in the 15th cent. and designated by its first words *Quod Deus* (QD)[17] asserts that

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13 Henricus de Hervordia, *Liber de rebus memorabilioribus sive chronicon Henrici de Hervordia*, ed. August Potthast, Gottingen 1859, p. 270.

14 Smoller, « Of Earthquakes, Hail, Frogs, and Geography », p. 179.

15 Blaise de Parme, *Questiones disputate super octo libros Physicorum*, II, q. 7: « [...] Video namque ranas moveri ab aere ibidem genitas, quod idem concedo de bove, ut ait Avicenna, et de asino, et ideo transeo ad secundam conclusionem quam dico esse simpliciter falsam et quando dicitur quod contingit materiam quamlibet disponi merito constelacionis nature, hoc tamen sive hoc concedatur sive non, merito astrorum numquam induceretur anima intellectiva que a Deo creata est, speciali gratia ipsius confluente. Et dico etiam quod si a media regione moveretur deorsum unum animal plasmatum ad instar forme humane, illud animal esset animal brutum nec esset homo » (quoted in van der Lugt, *Le ver, le démon et la Vierge*, p. 180, fn. 209). However, the idea of spontaneous generation in the air is not his invention, and in this respect he can hardly be credited with intellectual independence as van der Lugt does.

16 David Piché, Claude Lafleur (eds.), *La condamnation parisienne de 1277*, Vrin, Paris 1999 (Sic et non), p. 136: « Quod si in aliquo humore uirtute stellarum deueniretur ad talem proportionem cuiusmodi proportio est in seminibus parentum, ex illo humore posset generari homo; et quod homo posset sufficienter generari ex putrefactione ».

17 Claude Lafleur, David Piché, Joanne Carrier, « Le statut de la philosophie dans le décret parisien de 1277 selon un commentateur anonyme du XVe siècle: étude historico-doctrinale, édition sélective et synopsis générale des sources du Commentaire *Quod Deus* » in Jan A. Aertsen, Kent Emery Jr., Andreas Speer (eds.), *Nach der Verurteilung von 1277: Philosophie und Theologie an der*

> The proof of the falsity of this article is that it is impossible for a man to be generated by the power of the stars or planets from any humor because a humor alone cannot suffice for generating a man with regard to the matter or form deduced from the capability of the matter, but a substantial form is needed which is created by the glorious God alone and is not produced by influential power of the stars. And although the venerable master Albert in the fourth book of his *Summa* quotes that according to the noble Avicenna it once happened that a calf's body fell from the sphere of air, even if it had been true of the matter of a calf, it still could not be true of a man, for the substantial form of a man is created and not given by the power of the stars.[18]

QD refers here, as often, not directly to Albert, but to the compilation of his works (*Summa*) by Albert of Orlamünde. In this case, it has no textual consequences, for Albert of Orlamünde faithfully cites the *Meteora* of Albert the Great. It is interesting, however, that *QD* differs from both in making the calf fall not from the cloud (*de nube*), but from the air sphere (*de spera aeris*). In this, and in the general stance, it concurs with the text of Blasius of Parma.

Franz von Retz (d. 1427) included the calf argument into his *Defensorium inviolatae virginitatis beatae Mariae* – a collection of examples aimed at demonstrating that the Virgin Birth finds many *comparata* in other miraculous events. Albert was one of his principal sources alongside Isidore, Augustine, and Valerius Maximus. The *Defensorium* was transmitted in manuscripts, block-books and incunables, but the transmission came to an end with the rise of the Reformation.[19] Among the illustrations in the first block-book edition (year 1470)

Universität von Paris im letzten Viertel des 13. Jahrhunderts: Studien und Texte, De Gruyter, Berlin – New York 2001 (Miscellanea Mediaevalia, 28), p. 931–1003.

[18] For the Latin original see Roland Hissette, « Les recours et allusions à Albert le Grand dans deux commentaires du *Symbolum Parisinum* », in Aertsen, Emery, Speer (eds.), *Nach der Verurteilung von 1277*, p. 873–888, at p. 878, fn. 41: « Ratio falsitatis illius articuli est ista, quia uirtute stellarum seu planetarum, tunc impossibile est quod generaretur homo ex humore aliquo, quia ad generationem hominis non sufficit humor tantummodo loco materie seu forme educte de potentia materie, sed requiritur forma substantialis que creatur tantummodo a Deo glorioso et non producitur a uirtute influentiali stellarum. Et licet uenerabilis dominus Albertus Magnus, in quarto libro sue Summe, recitet quod nobilis Auicenna semel contigisse dicebat quod corpus uituli cecidit de spera aeris, tamen si hoc uerum fuisset de materia uituli, non tamen posset esse uerum de homine, quia forma substantialis hominis creatur et non datur uirtute stellarum ». See also Roland Hissette, « Le *Symbolum Parisinum*: Approche de trois commentaires médiévaux et evocation de doctrines significatives d'Albert le Grand », in Gianfranco Fioravanti, Claudio Leonardi, Stefano Perfetti (eds.), *Il commento filosofico nell'Occidente latino (secoli XIII-XV). Atti del colloquio Firenze-Pisa, 19-22 ottobre 2000,* Turnhout, Brepols 2002 (SIEPM – Rencontres de Philosophie Médiévale, 10), p. 469–498, at p. 480–481, fn. 61.

[19] The manuscript transmission is attested since the mid-fifteenth century. On the *Defensorium* and its author see Klaus Grubmüller, « Franz von Retz », in *Die deutsche Literatur des Mittelalters: Verfasserlexikon*, 2nd ed., vol. II, De Gruyter, Berlin – New York 1980, col. 834–837; Bruno Jahn, « Franz von Retz », in Wolfgang Achnitz (ed.), *Deutsches Literatur-Lexikon: Das Mittelalter*, vol II: *Das*

one sees a picture of a calf in a cloud pouring with rain.[20] The miracle is observed by a standing man and a kneeling woman (see Fig. 1, below). The text says:

Si vitulus in nube vi celi claret
Cur absq*ue* uiri pube uirgo non generaret
Albertus in meth*eororum* tractatu iij c*apitulo* xx°.

The German translation (accompanied by the Latin text and an ekphrasis of the picture) is preserved in a 15th-century MS:[21]

Mochten dy wolken clear
Krengen ayn kelbelein,
So mocht auch Maria zwaer
Ayn mueter juncfraw sein.

As a part of the *Defensorium* tradition the citation was reproduced by Hans Folz (d. 1513) in his *Meisterlieder*,[22] and by Sebastian Brant in his *Carmina in laudem virginis Mariae multorumque sanctorum* (c. 1498).[23]

geistliche Schrifttum des Spätmittelalters, De Gruyter, Berlin – Boston 2011, col. 636–640; FRIEDRICH ZOEPFL, « *Defensorium inviolatae virginitatis Mariae* », in *Reallexikon zur deutsche Kunstgeschichte*, 3 (1954), p. 1206–1218; EWALD M. VETTER, *Mariologische Tafelbilder des 15. Jahrhunderts und das Defensorium des Franz von Retz. Ein Beitrag zur Geschichte der Bildtypen im Mittelalter*, Diss. (masch.), Heidelberg 1954.

20 I have used the exemplar München, Universitätsbibliothek, Cim. 49 (here fol. 7v), available online at <http://daten.digitale-sammlungen.de/~db/0003/bsb00039969/images>. For a detailed description see HELGA LENGENFELDER, WOLFGANG MÜLLER (eds.), *Bibel der Armen — Speculum humanae salvationis — Canticum canticorum — Ars memorandi — Defensorium virginitatis Mariae — Apocalypsis — Der Endkrist und die 15 Zeichen — Ars moriendi — Regiomontanus: Deutscher Kalender für 1475 bis 1530*, Edition Helga Lengenfelder, München, 2004 (Monumenta xylographica et typographica, 5), p. 44–49. The image is reproduced by permission of University Library of Munich.

21 JOSEF PURKART, « Franciscus de Retza: *Defensorium inviolatae virginitatis*: Eine unbekannte Hs. aus dem Stift Lambach (Oö) », *Amsterdamer Beiträge zur Älteren Germanistik*, 3 (1972), p. 181–99, at 188.

22 HANS FOLZ, *Die Meisterlieder des Hans Folz aus der Münchener Originalhandschrift und der Weimarer Handschrift Q. 566 mit Ergänzungen aus anderen Quellen*, ed. AUGUST L. MAYER, Weidmannschen Buchhandlung, Berlin 1908 (Deutsche Texte des Mittelalters, 12), p. 247, no. 65: « Mocht Zirce mit den meren / Die lewt in thir verkeren, / ***Die lufft ein kalp geperen***, / Und sich/ Ein pach verkern in plute ».

23 SEBASTIAN BRANT, *Narrenschiff*, ed. FRIEDRICH ZARNCKE, Leipzig 1854, p. 176–177 (*Contra judaeos et haereticos, conceptionem virginalem fuisse possibilem argumentatio*): « Lac calibem et lanam narrant pluitasse libelli / Desuper et iustum compluere aura potest / Et vitulam cecidisse legis de nube serena / Sic cadit aethereo missus ab imbre puer, / Nonne et florilegis apibus generatio casta est / Concipiet veram non quoque mater apim? »

II.2. Humanistic and modern tradition

With Andrea Cattani da Imola, we move on to the humanistic thought.[24] In the 6th Question of the 1st Tractatus *De intellectu*,[25] he discusses the possibility of asexual human generation and considers in this connection Avicenna's views as exposed in *De diluviis*, but also takes into account his example with scorpions from the xvth book of *De animalibus*, then he goes over to Albert's explanation of monstruous births (a piglet with a human head, *Physica*, VIII) and impressions in stones (a king's head with a beard and a crown, *De mineralibus*, II) and adds from his own experience one more case – a hermit's figure. In conclusion, he adduces the citation about the calf falling from the heaven with a correct reference both to Albert and Avicenna. Thus he gives a very elaborated and comprehensive summary of Avicenna's thoughts on the problem, taking advantage of the calf quote for the purpose of his argumentation.

Pietro Pomponazzi considered the opinions of Aristotle, Avicenna and Averroes on spontaneous generation in his lectures delivered in 1518. He sided with Avicenna and consequently rejected Averroes's arguments and criticism. At one point he adduces the citation from Albert, but in a form very different both from the original and from the rest of the tradition. It is to be noted that he seems not to discard this example altogether as he says that « although Albert was a man susceptible to tales (*vir fabulosus*), he is a serious man (*vir gravis*) ». Pomponazzi does not mention Avicenna in this case and attributes the calf story directly to Albert, maintaining that it occurred in his times. Moreover, he omits the effect of the stars, making Albert state instead that it was the Devil's (or demons') work.[26] To be sure, the text was not written by Pomponazzi himself, but recorded by his students, and the deviations could be accounted for as a result of their misunderstanding or misinterpreting. But since the two records mostly agree and

[24] On the problems discussed in this section in general and on some prominent authors see Martin Craig, *Renaissance Meteorology: Pomponazzi to Descartes*, Johns Hopkins University Press, Baltimore 2011, esp. 93–102. On Italian Averroists see Dag Nikolaus Hasse, *Success and Suppression: Arabic Sciences and Philosophy in the Renaissance*, Harvard University Press, Cambridge, MA 2016 (I Tatti Studies in Italian Renaissance History, 19), esp. 179–248.

[25] Andrea Cattanius, *Opus de intellectu et de causis mirabilium effectuum*, [Florence *c.* 1502?], c5r–c8r. On his views see Paola Zambelli, « L'immaginazione e il suo potere: Da al-Kindī, al-Fārābī e Avicenna al Medioevo latino e al Rinascimento », in Albert Zimmermann, Ingrid Craemer-Ruegenberg (eds.), *Orientalische Kultur und europäisches Mittelalter*, De Gruyter, Berlin – New York 1985 (Miscellanea mediaevalia, 17), p. 188–206.

[26] Vittoria Perrone Compagni, « 'La stagione delli frumenti': Due lezioni di Pomponazzi sulla generazione spontanea », *Bruniana & Campanelliana*, 17 (2011), p. 199–219, at 215: « Et esto quod Albertus fuerit vir fabulosus, tamen est vir gravis. Dicit, iii Metheororum, tractatu iii iii libri, quod tempore suo pluit vitulus; et dicit quod fuit diabolus, qui fecit pluere. The second MS shows slight variation: Albertus dicit [...] quod tempore suo pluvit vitulus; alii dicunt quod non fuit ibi generatus et quod daemones portaverunt illum in nubibus ».

contain the same errors, it can be also assumed that these were the lecturer's words.

The next author, Tiberio Russiliano, discusses the argument at great length in his *Apologeticus* (1519)[27] while dealing – just as Andrea Cattani – with the issue of human generation after the Flood. He also refers to Avicenna's treatise *De diluviis* and immediately thereafter proceeds to the calf incident, coming to the conclusion that man can also be generated without semen.[28] He then remarks that it is improbable that such a man as Avicenna could have invented the story, as was falsely suggested by Averroes.[29] He says that it was a matter of dispute in Florence, some arguing that this opinion is not Avicenna's and was falsely attributed to him by Averroes although Avicenna had never asserted anything of this kind. However, if those are really Avicenna's words he must have been deceived by the appearance thinking that the calf was born in the air, while it could have been elevated by a whirlwind and transported through the air to the place where Avicenna saw it fall.[30] Russiliano examines and refutes Averroes's arguments against Avicenna and answers to the aforementioned objections that 1. it is hardly conceivable that Averroes would falsely attribute this opinion to Avicenna given that they were almost contemporaries and their opinions were widely known; moreover, if Averroes is not trustworthy, one should consult Avicenna's *De diluviis* where the

[27] See Zambelli, *Una reincarnazione di Pico*, p. 173–177, who regards the calf incident as a topos of the magical literature (ibid., p. 87–88: « come quel vitello che Avicenna avrebbe visto – secondo un topos di questa letteratura magica – materializzarsi nel cielo nuvoloso e poi planare di li sulla terra »); cf. also Paola Zambelli, *Une réincarnation de Jean Pic à l'époque de Pomponazzi: les theses magiques et hérétiques d'un aristotélicien oublié, Tiberio Russiliano Sesto Calabrese (1519)*, Steiner, Wiesbaden 1977 (Abhandlungen der geistes- und sozialwissenschaftlichen Klasse, Akademie der Wissenschaften und der Literatur, 10), p. 41; see also Dag Nikolaus Hasse, « Avicenna's 'Giver of Forms' in Latin Philosophy, Especially in the Works of Albertus Magnus » in Dag Nikolaus Hasse, Amos Bertolacci (eds.), *The Arabic, Hebrew and Latin Reception of Avicenna's Metaphysics*, De Gruyter, Berlin – New York 2012 (Scientia Graeco-Arabica, 7), p. 225–249, at 237.

[28] Zambelli, *Une réincarnation de Jean Pic*, p. 173: « Movit praeterea Avicenna sensus ipse, cum viderit vitulum de nube cecidisse, quare rationabiliter credidit illum in aere genitum fuisse; tunc ultra si animalia perfecta possunt in aere generari, a fortiori et in terra, cum in ea meliores et perfectiores fiant continuo mixtiones quam in aere. [...] Quare generationes perfectiores fieri poterunt, quare igitur si in aere vitulus gigni potuit, cum perfectior fiat generatio in terra, poterit quoque homo ibidem generari. Praeterea experientia docet diversa viventia in terra oriri merito terrae, rarissime in aere, qualiter, si vitulus potuit in aere generari quanto [20r] magis et in terra maior vitulo generabitur... ».

[29] Ibidem: « nec est conveniens aut credibile tantum virum (ut Avicenna fuit) haec fictitasse, ut falso sibi ascribit Averroes ».

[30] Ibid., p. 175–176: « Primo quod haec opinio non sit Avicennae, licet illud Averrois sibi falso ascribat, cum nunquam illud Avicenna asserat. Secundo dato quod sit Avicennae, Avicenna deceptus ex apparentia vituli fuit, credidit namque vitulum genitum in aerem fuisse, cum illud falsum fuerit, quia cum in vitulo terra praedominetur potuit in terra generari, potuit praeterea vitulus ex turbine in altum elevari et per aliquod spatium a ventis per aerem portari, cumque decideret Avicenna credit illum fuisse ortum in loco unde ceciderit ».

theory of spontaneous generation is held; and that 2. Avicenna made a conjecture on the probable origin of the calf he saw fall from the sky with his own eyes, but he did not see it being lifted up from the earth. In this chapter, Russiliano endorses Avicenna's views on the possibility of asexual human generation and sees the calf story as a credible corroboration of his theory.

His account contains many important points. It tells us that the calf incident was vividly debated in Florence in his time and addresses the arguments of his opponents. One of these – that the calf was in reality transported through the air by a whirlwind – will be accepted as a standard objection by later scholars. But more interesting is the link between Avicenna and Averroes that is continuously underscored by Russiliano. The juxtaposition of their names can give an impression that the calf example was perceived at least by some scholars as falsely attributed to Avicenna by Averroes, for this assertion follows immediately after the discussion of Avicenna's calf. However, it may well be that the reproach of distorting Avicenna's views refers not particularly to the calf argument, but to the theory of spontaneous generation as a whole as shows Russiliano's refutation of this view.[31]

While Andrea Cattani was pointedly neutral in his description of the calf incident, and Tiberio Russiliano was an ardent proponent of Avicenna's theory, including this story, our next author Agostino Nifo (d. 1538), a famous Averroist and commentator of Aristotle,[32] takes a completely different stance. In addressing the problem of generation from semen and from putrefied matter in his *Dilucidarium* (completed in 1510), he mentions the traditional Hermetic dictum that there is nothing on the earth that does not have its star in the heaven caring for its growth, and then recounts Avicenna's theory and its criticism by Averroes, concluding that Hermes did not mean the stars to be sufficient for generation: they only facilitate it. He declares that what Avicenna tells about the calf must be a fiction (*fabula*), and even if it really took place, the calf was not capable to live as a cow and could not be animate.[33] However, in his Commentary on Aristotle's

[31] Ibid., p. 176: « Ad quae nos respondentes faciliter diximus, ad primum, quod non est credendum tantum virum, ut Averroem, in cunctis disciplinis disertissimum, falso hanc opinionem Avicennae attribuere, praesertim cum fere contemporanei fuerint, quorum opiniones famosissime habebantur; at si Averroi nulla sit tribuenda fides, inspiciatur codicillus Avicennae De diluvio, ubi passim hanc opinionem sentit, quem credimus arguentem nunquam vidisse ».

[32] On him cf. Charles H. Lohr, *Latin Aristotle Commentaries*, vol. II: *Renaissance Authors*, Leo S. Olschki – SISMEL Edizioni del Galluzzo, Firenze 1988 (Subsidia al Corpus philosophorum Medii Aevi, 6), p. 282–287; more detailed Linda Deer Richardson, *Academic Theories of Generation in the Renaissance: The Contemporaries and Successors of Jean Fernel (1497–1558)*, Springer, Cham 2018 (History, Philosophy and Theory of the Life Sciences, 22), p. 111–122; Hasse, *Success and Suppression*, p. 206–214.

[33] Augustinus Niphus, *Dilucidarium philosophi solertissimi metaphysicarum disputationum in Aristotelis decem et quatuor libros metaphysicorum...*, apud Hieronymum Scotum, Venetiis 1559, p. 189: « sic

Meteorology (first ed. in 1531) he is much more restrained and retells the calf incident without reservation.[34]

Ludovico Boccadiferro (1482–1545), another Averroist and commentator on Aristotle from Bologna,[35] holds the calf incident for impossible on the grounds that generation of a perfect animal in such a way would contradict Aristotle's teaching. Therefore it must be rejected that a calf could be born in a cloud, but if such accident did occur in reality, it must have had another cause. The calf could be brought up to the cloud by winds, and if animals sometimes fall from the sky, it is because of winds that get them there.[36] Thus, he sided with those critics mentioned by Russiliano (cf. above) who preferred to explain the incident by the power of the whirlwind. This line of argumentation was adopted by Francesco Vimercato (1512–1571)[37] who suggested that either Avicenna had invented the incident or he had been too credulous of a tale told by someone else. However, if he or a credible witness had seen it with their eyes, then they must have been deceived by a whirlwind that carried the calf on the air and let it fall subsequently.[38]

The highly influential *Coimbra Commentaries* on Aristotle composed by the Jesuits and reprinted more than 100 times since their first appearance[39] involve the calf quotation in the same context of asexual generation of perfect animals by the celestial power alone along with other arguments such as the occurrence of

patet illud quod dixit Avicenna de vitulo, esse fabulam, cum ait ex nube cecidisse corpus vituli, illud n[on] si fuit, non erat capax vitae bovis, non potuisset esse animal ».

34 Id., *Subtilissima commentaria in libros Meteorologicorum*, apud Hieronymum Scotum, Venetiis 1560, col. 412: « Aliquando ut Avicenna narravit cecidit corpus vituli, mortui tamen. Horum causas physici dixerunt esse partis sicce cum humida secundum diversas proportiones ».

35 See Lohr, *Latin Aristotle Commentaries*, vol. II, p. 57–65.

36 Ludouicus Buccaferreus, *Lectiones, in secundum, ac tertium meteororum Aristotelis libros*, apud Hieronymum Scotum, Venetiis 1570, p. 49: « sic dico quod in hoc debemus recedere ab Avicenna quia haec animalia perfecta apud Aristotelem non possunt generari, nisi ex semine et ex conjunctione maris cum foemina, et hoc propter eorum perfectionem, et non possunt aliter generari, ut vult Avicenna et sic negandum est ibi fuisse genitum vitulum in nube, sed si ibi fuit ad fuit ex alia causa quia .s. ex ventis fuit ille vitulus ibi delatus, et sic si aliquando cadunt ista animalia est quia ab aliquo vento ibi fuerunt illa animalia impulsa, non quod ibi sint genita ».

37 On his life and work see Neal W. Gilbert, « Francesco Vimercato of Milan: A Bio-Bibliography », *Studies in the Renaissance*, 12 (1965), p. 188–217; Lohr, *Latin Aristotle Commentaries*, vol. II, p. 479–481; Hasse, *Success and Suppression*, p. 221–224.

38 Franciscus Vicomercatus, *In quatuor libros Aristotelis meteorologicorum commentarii*, ex off. Dominici Guerrei, Venetiis 1565, p. 130–131: « Aut igitur Avicenna, si vitulum eum cadentem non viderit, illud commentus est, aut, quoniam hoc philosopho dignum non est, aliis id nuntiantibus nimis leviter credidit, aut si ipse, vel alius fide dignus viderit, turbine aliquot vitulus ille alio in loco sublatus est, tum in terram, ubi Avicenna erat, vel alius, demissus, ut e nubibus cadere videretur ».

39 See, e.g., Mário S. de Carvalho, « The Concept of Time according to the Coimbra Commentaries », in Pasquale Porro (ed.), *The Medieval Concept of Time: Studies on the Scholastic Debate and Its Reception in Early Modern Philosophy*, Brill, Leiden 2001 (Studien und Texte zur Geistesgeschichte des Mittelalters, 75), p. 353–382, with bibliography; Lohr, *Latin Aristotle Commentaries*, vol. II, p. 98–100.

animals on the islands far off in the sea, Lusitan and Cappadocian horses conceiving from the wind, and phoenixes born from ashes and not from an egg. After a detailed discussion, the conclusion is made that the calf could not be created by the celestial influence, but was transferred by the wind or through the interference of the demons.[40] Leonardus Vairus, bishop of Pozzuoli (d. 1603), in his treatise on witchcraft *De fascino* (1583)[41] in a chapter proving that nobody can « fascinate » by means of sky observation, likewise asserts that no perfect animal can be created except from semen and the female womb, and that the calf allegedly seen by Avicenna was either a dream or a tale, but even if it were seen by anyone, it must have been elevated by a whirlwind and then fallen as if from the sky.[42]

Michael Neander (1525–1595), Rector at the German monastic school of Ilfeld, catalogues the calf among various other things known to have fallen from the skies, with reference both to Albert and Avicenna, in the manner of *mirabilia*.[43] Jacobus Pontanus (1542–1626), another Jesuit, in his widely popular textbook *Progymnasmata latinitatis* notes ironically:

> I am very uncertain about what Albert adduces from Avicenna that the whole calf fell down once with the rain; on the same grounds I think sheep and cows can also fall therefrom. The same Avicenna had seen a 100-librae iron boulder fall from the clouds, from which then outstanding swords were made. I wonder: if a calf could be formed there, why not swords for it would save the blacksmiths' work.[44]

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[40] *Commentarii Collegii Conimbricensis, Societatis Iesu, in quatuor libros de Coelo Aristotelis Stagiritae*, ex off. Simonis Lopesij, Olisipone 1593, p. 178: « Vitulum autem Avicennae dicimus non fuisse genitum coelesti influxu, sed aliunde magno aliquo ventorum impetu, seu Ecnephia abreptum alio in loco decidisse, aut daemonum opera, ut nonnunquam fit, delatum ». Cf. also Pedro de Fonseca, *Commentariorum in Metaphysicorum Aristotelis Stagiritae Libros*, t. III, Lazarus Zetzner, Coloniae 1615, p. 247: « Constat enim in insulis a continenti disiunctissimis inventa esse plurima perfecta animalia, ubi post generale diluvium, antequam in eas navigarent homines, non potuerunt illa vel enatando pervenire, vel aliter, quam ex putri materia generari. Addit Avicenna visum aliquando vitulum in nubibus genitum cum imbre decidisse ».

[41] See Thorndike, *History of Magic*, vol. VI, p. 528–529.

[42] Leonardus Vairus, *De fascino libri tres*, apud Nicolaum Chesneau, Parisiis 1583, p. 199: « Nec minus a ratione alienum censeo hoc, quam quod alibi Auicenna affirmat, se scilicet vitulum e fulmine cadentem uidisse. Nam quamuis animalia minus perfecta, ut ranae in aere, ex materia praeparata procreari possint, perfectum tamen non nisi ex semine in femellae utero gigni potest; quo fit ut Auicenna, aut vitulum illum cadentem somniauerit, aut aliis narrantibus nimis leuiter crediderit. Aut si ipse aut alius fide dignus viderit; turbine aliquo uitulus alio in loco sublatus fuit, deinde in terram ubi Auicenna aut alius erat, demissus, ut e nubibus cadere videretur, nam lapides et animalia in sublime subduci per turbinem possunt ».

[43] Michael Neander, *Physice, sive potius syllogae physicae rerum eruditarum...* Pars I, ex off. Abrahami Lambergi, Lipsiae 1591, p. 78–79: « Albertus Avicennam autorem allegat, qui referat integrum vituli corpus in pluvia e nubibus in terram decidisse ».

[44] Jacobus Pontanus, *Progymnasmatum latinitatis sive Dialogorum Voluminis tertii pars prior...*, Adam Sartorius, Ingolstadt 1598, p. 260: « Quod ex Avicenna Albertus adducit, aliquando vitulum integrum cum pluvia decidisse, de eo valde sum incertus, et eadem ratione oves et boves inde

Francesco Piccolomini (1523–1607), Professor at the University of Padova,[45] was even more sceptical and denied the generation in the air not only for calves, but also for frogs. To the previous scholarship he adds evidence that the whirlwind can lift even heavily laden mules up in the air.[46] Tommaso Garzoni (1549-1589), a famous Italian author, included the calf story with references to the opinions of Vimercati and Piccolomini in his encyclopaedic compendium of mirabilia *Il serraglio de gli stupori del mondo*.[47]

Thus, the sixteenth century witnessed the establishment of a more and more critical view on the calf citation. The Renaissance scholars, primarily commentators of Aristotle, made wide use of Averroes's criticism to the degree of mocking Avicenna's allegedly unfortunate invention. This attitude continued for the next two centuries. That almost every scholar saw it as his duty to refute and explain away Avicenna's calf, testifies to the fact that it had become a kind of a textbook argument;[48] this contributed to its unusual longevity. The only positive evaluation from the period after Agostino Nifo that I know of comes from the Irish Franciscan theologian Bonaventure Baron. In his commentary on Aristotle's *De coelo et mundo*, while answering the question if heaven could produce animate beings, he insists that in this respect, there can be no difference between imperfect and perfect animals, and both can be formed by the influence of the stars, although stars cannot give them souls, quoting Avicenna's case as conclusive evidence.[49] But

posse delabi puto. Ille idem Avicenna conspexit massam ferri centum librarum e nubibus decidere, unde postmodum gladii praestantes fabricati sint. Miror tamen, si vitulus ibidem formari potuit, cur enses non potuerint: ut hoc labore qui fabricam ferrariam exercent liberarentur ». The iron boulder example goes back to Avicenna's *De mineralibus*, although with some deviations. On Pontanus see HERBERT JAUMANN, *Handbuch Gelehrtenkultur der Frühen Neuzeit,* vol. I: *Bio-bibliographisches Repertorium*, Berlin – New York, 2004, 530–531.

45 LOHR, *Latin Aristotle Commentaries*, vol. II, p. 331–342.

46 FRANCISCUS PICCOLOMINEUS, *Librorum ad scientiam de natura attinentium Pars Quarta, in qua Meteorologica explicantur*, apud Franciscum de Franciscis Senensem, Venetiis 1596, fol. 11r–v: « puto huiusmodi ranulas prius ex propriis principiis in terra fuisse genitas, et latere in rimis et cavitatibus terrae, et superveniente pluvia eis salutari, exire, et saltare, quare si Vitulus cecidit, alibi a vento fuit elevatus, ut a vehementi vento elevatos ferunt mulos, etiam salma gravatos ».

47 TOMASO GARZONI DA BAGNACAVALLO, *Il serraglio de gli stupori del mondo, di. Diuiso in diece appartamenti...*, appr. Ambrosio et Bartolomeo Dei, Fratelli, Venice 1613, p. 695–696.

48 Cf. LIBERTUS FROMONDUS, *Meteorologicorum libri sex*, apud Balthasarem Moretum et viduam Ioannis Moreti et Io. Meursium, Antverpiae, 1627, p. 333: « Avicenna vitulum etiam quemdam pluvialem in Scholis nostris celebravit ». Also LEONARDUS SCHIFFERDECKER, *Disputatio meteorologica quam in alma, catholica, et electorali universitate ingolstadiensi praeside: P. Iosepho Vogler*, typis Joannis Lucae Straubii, Monachii 1694, p. 69: « Celebris est vitulus Avicennae ».

49 BONAVENTURA BARO, *Fr. Joan. Duns Scotus Ordinis Minorum doctor subtilis, per universam philosophiam, logicam, physicam, metaphysicam, ethicam, contra adversantes defensus, quaestionum novitate amplificatus*, t. III, *Metaphysicam, ethicam, ac apologias selectas complexus*, apud Ioannem Busaeum, Coloniae Agrippinae 1664, p. 36: « Avicenna praedixit vitulum ex astris lapsurum, quod factum est, et tamen vitulus est ex perfectis animantibus ».

the overwhelming majority followed the steps of Boccadiferro and Vimercato dismissing the calf incident as the work of the wind. It will suffice just to mention some of the names and go into detail only if new information or arguments are added.

We move on to the 17th century with Daniel Sennert (1572–1637), a famous German physician,[50] and Libert Froidmont (1587–1653), Professor at Louvain, who remarks rather sarcastically: « I would be a great calf if I thought it generated in the clouds ».[51] An additional argument widely used afterwards was provided by Niccolò Cabeo (1586–1650) who recalled that about 1615 in Mantua, a woman had been carried away by the whirlwind while laundering at the lake and transported a long distance through the air, but there is no mention of 'raining a woman' in the chronicles.[52] Among the most prominent seventeenth-century scholars to reject Avicenna's story were also Pierre Gassendi,[53] his friend and translator François Bernier,[54] Kaspar Schott (1608–1666),[55] Antoine Le Grand,[56] Gaetano Felice Verani

[50] Daniel Sennertus, *Epitome scientae naturalis*, ex off. Nicolai Ballii, Wittenberg 1618, p. 314: « Imo nonnuli ex Avicenna referent, aliquando vitulum coelo delapsum esse ». A detailed account of Sennert's views see in Hiro Hirai, *Medical Humanism and Natural Philosophy: Renaissance Debates on Matter, Life and the Soul*, Brill, Leiden – Boston 2011 (History of Science and Medicine Library, 26, Medieval and Early Modern Science, 17), p. 162–168.

[51] Fromondus, *Meteorologicorum libri sex*, p. 74: « Aedificia quoque et ingentes arbores turbinibus saepe eradicantur, et animalia in sublime abripiuntur, quomodo forte olim abreptus ille vitulus, quem repluisse narrat Avicenna: nimis enim vitulus sim, si putem in nubibus generatum ».

[52] Nicolaus Cabeus, *In quatuor libros meteorologicorum Aristotelis commentaria et quaestiones*, t. I, typis haeredum Francisci Corbelletti, Romae 1646, p. 282: « dum enim dicitur pluisse vitulum; num quid in nubibus genitum illud animal perfectum dixeris? Apage, cur non vaccam aut bovem enixae sunt nubes? A turbine abreptus vitulus decidit, non pluit. Memini Mantuae circa annum 1615 contigisse, ut ventus vehementissimus et prodigiosus flaret. Hic turbo inter alia abripuit mulierem, lavantem pannos ad lacum et per aera asportavit procul longissime: nunquid ideo in annalibus referendum Mantuae pluisse mulierem, etiamsi longe procul asportasset ». On Cabeo see Martin, *Renaissance Meteorology*, p. 107–124.

[53] Petrus Gassendus, *Opera omnia in sex tomos diuisa*, t. II, sumpt. Laurentii Anisson et Ioannis Baptistae Devenet, Lugduni 1658, p. 77: « Sed uno etiam verbo, pluisse aliquando vitulo, ut ab Avicenna scriptum memorant, nimis quam fabulosum est; nisi quod excusari solet, quatenus potuit vitulus ex uno loco, vi turbinis cujuspiam immanis abreptus, in alium transferri ac decidere; ut, si qui cadentem observaverint, existimare potuerint genitum fuisse in nubibus et ex nubibus decidisse ».

[54] François Bernier, *Abregé de la philosophie de Gassendi*, t. V, chez Anisson, Posuel et Rigaud, Lyon 1684, p. 203.

[55] Gaspar Schottus, *Physica curiosa, sive Mirabilia naturae et artis libris XII*, sumpt. Johannis Andreae Endteri et Wolffgangi Jun. haeredum, Würzburg 1662, p. 1511: « Aio itaque, Vitulum Avicennae non fuisse in nubibus generatum, sed a vento aliunde abreptum decidisse cum pluvia alicubi, indeque natam fabulam pluisse vitulo ».

[56] Antonius le Grand, *Historia naturae, variis experimentis & ratiociniis elucidata*, apud J. Martyn, London 1673, p. 253: « Refert Avicenna vitulum aliquando pluisse, et ex alto etiam coelo cum maximo imbre decidisse. Haud arbitror Avicennam duxisse vitulum in nubibus procreatum esse, et illic materiam animalibus compingendis idoneam suppetere. Sed solum vitulum aliunde ingenti

(1647–1713), with a reference to Cabeo's woman,[57] and Juan Cano (d. 1705), the bishop of Badajoz.[58] Even the alchemists who were once eager to base their transmutation principle argumentation, among others, on the calf case (see above on Petrus Bonus), kept pace with the other sciences and now regarded it as dubious.[59] A peculiar interpretation was offered by John Wilkins in his *Discovery of a World in the Moone* (1638). While investigating the question why nothing falls from the moon, he adduces « fabulous relations of such things as have dropped thence » – *inter alia*, the calf episode, which he renders in a very curious way saying: « Thus Avicenna relates the story of a Calfe which fell downe in a storme, the beholders thinking it a Moone-calfe, and that it fell thence ».[60] No one has previously or subsequently associated Avicenna's calf with the moon, nor is there any mention of other beholders, so that Wilkins appears to have adjusted the motif to his own ends.

During the 18th century, the interest in Avicenna's calf begins to fade remarkably. It ceases to be mentioned by the top scientists and recurs only sporadically in the works of others – e.g. Giacinto Gimma (1668–1735), a canon at the Bari cathedral and encyclopaedist, who addressed this issue more than once;[61]

turbine esse abreptum, et cum pluvia in distantem aliquem locum delatum. Quis nescit fluxam coeli substantiam hujusmodi efformandis corporibus esse ineptam? quamodo tanta moles in nubibus sustineretur, et ante completam generationem non dilaberetur? An quia Avicenna quondam vitulo pluisse scripsit, compactus in nubibus vitulus est? Sed illi credant, qui authoritati potius quam rationi patrocinantur, et qui omnia promiscue admittunt, quae ab antiquis Authoribus aut narrata sunt, aut somniata ».

57 Gaetano Felice Verani, *Philosophia Universa Speculativa Peripatetica*, t. III, sumpt. ac typis Joannis Jaecklini, Monachii 1686, p. 706.

58 Ioannes Cano, *Tomus quartus Cursus philosophici: In quo quatuor libri Aristotelis De coelo et mundo exponuntur et exornantur*, Gregorii Ortiz Gallardo, Salamanticae 1693, p. 205.

59 Johannes Freytag, *Kurtzer Bericht von der Melancholia hypochondriaca [...] Darbey deß Wundersteins der Weißheit und Reichthumbs nicht vergessen wird*, bey Caspar Röteln, Frankfurt am Main 1644, p. 407: « Was der Avicenna schreibt von einem Kalb welches in den Wolcken worden unnd noch halb lebendig hinab mit dem Regen gefallen, das lassen wir an seinen Ort gestellet seyn, weil er und der Plinius bißweilen die Axt gar zu weit werffen ». This passage was *verbatim* reproduced by Johann Michael Faustius, *Compendium alchymisticum novum sive Pandora explicata*, Verlegts Johann Zieger, Leipzig 1706, p. 444.

60 John Wilkins, *The Discovery of a World in the Moone, or A Discourse Tending to Prove that 'tis probable there may be another habitable World in that Planet*, printed by E. G. for Michael Sparke and Edward Forrest, London 1638, p. 113.

61 Hyacinthus Gimma, *Dissertationum academicarum tomus primus: I. De hominibus fabulosis; II. De fabulosis animalibus, in qua legitur De fabulosa generatione viventium*, ex typ. Michaelis Aloysii Mutio, Neapoli 1714, p. 189, citing Vimercati; Id., *Della storia naturale delle gemme, delle pietre, e di tutti i minerali, ovvero della Fisica sotterranea*, vol. II, nella stamperia di Gennaro Muzio, Napoli 1730, p. 521: « Ridicola e la relazione di Avicenna in lib. De diluvio, che qualche volta un Vitello generato tra le Nuvole sia caduto colla pioggia; e cosi dicono ancora di altri animali ».

Leopold Gramiller (1665–1722), a Catholic preacher and author;[62] and Giuseppe Antonio Ferrari da Monza (d. 1776), a Franciscan author, whose arguments are also derivative.[63]

The references found in citations and recounts adduced above may vary, but they focus on the three names: Albert the Great, Avicenna and Averroes. It is, however, obvious that they all ultimately go back to the passage from Albert with which we have started the present study. It is therefore reasonable to examine the citation and its interrelation with other important themes and motifs in Albert's writings and to attempt to detect if his attribution to Avicenna can be corroborated.

III. *Albert the Great*

The *Meteora* of Albert the Great, written between 1250 and 1254,[64] is an elaborate and extensive commentary on the *Meteorology* of Aristotle. But what he commented on was actually a text quite different from Aristotle's original. He used the Latin translation made by Gerard of Cremona (1114–1187) from the Arabic translation by Yaḥyā ibn al-Biṭrīq (*c.* 800). However, Gerard accomplished the translation of only the first three books of the *Meteorology*; the fourth book had been translated earlier from Greek by the Sicilian Henricus Aristippus (d. 1162).[65]

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[62] Leopold Gramiller, *Ariadne Evangelica, Oder Christliche Weegweiserin*, in Verlag Georg Schlüter und Martin Happach, Augsburg 1724, p. 502: « Es widersprechen aber diese Maynung des Avicennae alle vernünfftige Welt-Weise, und mit denenselben alle Theologi, oder Gottes-Gelehrte, einhellig behauptende, daß aus einer faulen Materi vermittelst der Sonnen Einflußes allein die unvollkommene Thier, als da seynd die Frösche, die Mäuse und andere dergleichen, keines Weegs aber die vollkommene Thiere, wie ich schon angezogen und gemeldet hab, produciret und gezeuget werden können ».

[63] Josephi Antonii Ferrari de Modoetia, *Philosophia peripatetica Adversus Veteres, et Recentiores Praesertim philosophos firmioribus, propugnata rationibus Ioannis Dunsii Scoti*, editio secunda, t. III, apud Thomam Bettinelli, Venetiis 1754, p. 127: « Verum quamplurima ex his fabulosa esse, nemo non videt. Ut cum dicitur vitulum pluisse. Hoc enim commentitium prorsus, ac ridiculum est; nisi quod excusari solet Avicennas, quatenas potuit vitulus ex uno loco, vi turbinis cujuspiam immanis abreptus, in alium transferri, ac decidere, ut qui cadentem observarunt, existimare potuerint genitum fuisse in nubibus, et e nubibus decidisse ».

[64] See the time-table in James A. Weisheipl, « Albert's Works on Natural Sciences (*libri naturales*) in Probable Chronological Order », in Id. (ed.), *Albertus Magnus and the Sciences: Commemorative Essays 1980*, Pontifical Institute of Mediaeval Studies, Toronto 1980 (Studies and Texts of the Pontifical Institute, 49), p. 565–577.

[65] On Aristippus' translation see Luigi Minio-Palluelo, « Henri Aristippe, Guillaume de Moerbeke et les traductions latines médiévales des *Météorologiques* et du *De generatione et corruptione* d'Aristote », *Revue Philosophique de Louvain*, 45 (1947), p. 206–235; Carlos Steel, « A Philological Diet for Philosophers: Aristippus' Translation of Book IV of Aristoteles' *Meteorology* and Albert the Great », in Alessandro Palazzo (ed.), *L'Antichità classica nel pensiero medievale: Atti del convegno della Società Italiana per lo Studio del Pensiero Medievale (SISPM), Trento, 27–29 settembre 2010*, Brepols, Turnhout 2011 (Textes et études du Moyen Age, 6), p. 79–106.

Alfred of Sareshel was very likely the man who added this fourth book in Aristippus's translation to the three books translated by Gerard and supplemented them with his own translation of a couple of chapters on minerals from Avicenna's *Kitāb al-shifāʾ* which is generally known under the title *De mineralibus* or *De congelatione et conglutinatione lapidum*.[66] The work which, as we see, is a heterogenous compilation was transmitted as a whole and often indiscriminately attributed to Aristotle. This was the only text of the *Meteorology* available in the West until the appearance of a new translation by William of Moerbeke who translated the Greek original and cut out the additional chapters during Albert's lifetime, but only after Albert had composed his commentary. However, the dubious authenticity of the *De congelatione et conglutinatione lapidum* was being increasingly recognized by the scholars already in 13th century.[67] Albert had been well aware of Avicenna's authorship before the new translation of the *Meteorology* came into circulation as can be most clearly seen from Albert's *De mineralibus* I, I, 2 where he cites and paraphrases *De congelatione and conglutinatione* properly referring to Avicenna.[68]

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[66] See Charles Burnett, « The Coherence of the Arabic-Latin Translation Program in Toledo in the Twelfth Century », *Science in Context*, 14 (2001), p. 249–288, at 261; Id., « Arabic into Latin: The Reception of Arabic Philosophy into Western Europe », in Peter Adamson, Richard C. Taylor (eds.), *The Cambridge Companion to Arabic Philosophy*, Cambridge University Press, Cambridge 2005, p. 370–404, at 374 and fn. 13 at p. 388; Steel, « A Philological Diet for Philosophers », p. 88–89; Jean-Marc Mandosio, « Follower or Opponent of Aristotle? The Critical Reception of Avicenna's *Meteorology* in the Latin World and the Legacy of Alfred the Englishman », in Dag Nikolaus Hasse, Amos Bertolacci (eds.), *The Arabic, Hebrew and Latin Reception of Avicenna's Physics and Cosmology*, De Gruyter, Berlin – New York 2018 (Scientia Graeco-Arabica, 23), p. 459–534; on compilation see also Gudrun Vuillemin-Diem (ed.), *Meteorologica. Translatio Guillelmi de Morbeka*, 2 vols., Brepols, Turnhout 2008 (Aristoteles Latinus, 10 2.1), p. 5–9; for the edition of Gerard's translation see Pieter L. Schoonheim, *Aristotle's Meteorology in the Arabico-Latin Tradition: A Critical Edition of the Texts, with Introduction and Indices,* Brill, Leiden – Köln 2000 (Aristoteles Semitico-Latinus, 12).

[67] See Vuillemin-Diem (ed.), *Meteorologica* (Aristoteles Latinus, 10 2.1): *Praefatio*, p. 9, fn. 27; on the later reception cf. also Martin Craig, « Scientific Terminology and the Effects of Humanism: Renaissance Translations of Meteorologica IV and the Commentary Tradition », in Michèle Goyens, Pieter De Leemans, An Smets (eds.), *Science Translated: Latin and Vernacular Translations of Scientific Treatises in Medieval Europe*, Leuven University Press, Leuven 2008 (Mediaevalia Lovaniensia. Series 1. Studia, 40), p. 155–180, at 162–164.

[68] Albertus Magnus, *Book of minerals*, trans. Dorothy Wyckoff, Clarendon Press, Oxford 1967, p. 13: « Avicenna testifies to this when he says that pure Earth does not become stone, since on account of its dryness Earth does not produce coherence, but rather a tendency to break into little pieces; for the dryness predominating in it prevents it from sticking together. The same philosopher explains that sometimes clay is dried out and becomes something intermediate between stone and clay, and then after a while it becomes stone. And again he says that the clay most suitable for transmuting into stone is unctuous, and the reason why that kind does not break into little pieces or crumble into dust is that its moisture is not easily separable from it ». See also ibid., 284. For the Latin text see *Opera omnia*, ed. Borgnet, vol. V.

The calf episode appears in the section on thunder and lightning, both of which Albert has quite much to say about, dedicating the whole 3rd treatise of the 3rd book to them. Albert thoroughly analyses the topics absent from or unsatisfactorily covered in Gerard's translation[69] in many digressions, one of which contains the calf example. This example is to be found neither in the original text of Aristotle, nor in its Arabic translation by Yaḥyā ibn al-Biṭrīq, nor in the translation by Gerard, nor, to provide a full picture, in the later translation by William of Moerbeke. As we have seen, this digression deals with the question of what exactly strikes from the cloud, and the fall of the calf exemplifies that not only minerals, but also perfect animals can be formed from the vapor on high. One may get the impression, though, that the example, however fitting here into his line of argument, is somehow misplaced since one of the motifs it incorporates is a well known theory of spontaneous generation which Albert directly addresses quite often.

For example, in the same *Meteora* (II, 1, 21) he explains that many aquatic animals such as frogs, little fishes and worms can be generated with the rain because when the heat which is in the cloud starts evaporating, it draws outside subtle and humid matter which is well mixed with the subtle earthly matter and therefore becomes viscous. But when this viscosity is exposed to the air, it starts thickening and stiffens into skin. The heat pulsating continuously inside causes breathing, and the sensitive soul is added to it due to the influence of the stars. Thus an animal is brought to life. However, so are generated mostly aquatic animals, since water prevails in such a rain.[70]

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[69] Tr. II, sermo 9 = p. 110–116 of Schoonheim's edition.

[70] « Quia pluvia fit de vapore multum habente de terrestri, ideo, cum suavis est, aliquando cum pluvia generantur multa animalia aquatica, sicut ranunculi et pisces parvuli et vermes. Cujus causa est, quia calidum, quod est in nube, cum evaporare incipit, trahit secum humidum subtile, quod in se habet aliquid de subtili terreo bene commixto; et ideo est viscosum. Cum autem viscosum ducitur ad aerem, incipit durescere et in pellem constare. In qua continue pulsans calidum, efficit spiritum. Cui additur anima sensibilis virtute stellarum. Et tunc fit animal. Fiunt autem hec ut plurimum aquatica, quia in tali pluvia vincit aqua ». On this passage see also SMOLLER, « Of Earthquakes, Hail, Frogs, and Geography », p. 179. For a very similar description see his *De animalibus* VI, 3, 3 (ed. HERMANN STADLER, Aschendorff, Münster 1916-1920, p. 494–495). Cf. discussion of the theory of spontaneous generation in the writings of Albert in VAN DER LUGT, *Le ver, le démon et la vierge*, p. 140–143 and 170–176; DAG NIKOLAUS HASSE, « Spontaneous Generation and the Ontology of Forms in Greek, Arabic, and Medieval Latin Sources », in PETER ADAMSON (ed.), *Classical Arabic Philosophy: Sources and Reception*, The Warburg Institute and Aragno, London – Turin 2007 (Warburg Institute Colloquia, 11), p. 150–175, p. 164. On spontaneous generation in Islamic sources see REMKE KRUK, « A Frothy Bubble: Spontaneous Generation in the Medieval Islamic Tradition », *Journal of Semitic Studies*, 35/2 (1990), p. 265–282; cf. also PAOLA ZAMBELLI, « 'The Earth was like a Sponge and Men Lived within it': Ideas on Spontaneous Generation of Man among Islamic and Latin Thinkers », in EAD., *Astrology and Magic from the Medieval Latin and Islamic World to Renaissance Europe: Theories and Approaches*, Ashgate, Farnham 2012 (Variorum Collected Studies Series, 997).

Albert never mentions the calf episode anywhere else in his works, neither in relation to spontaneous generation nor in any other context.[71] Nevertheless, the wording of the passage which mentions the formation of an animal body by the means of the formative power of the stars strongly suggests its direct connection with the other discussions of spontaneous generation found in Albert's writings. What is most interesting about the calf example is that it seems to contradict Albert's own views that perfect animals cannot be generated solely by the influence of the stars, which are most explicitly expressed in *De causis propr.* I, 2, 13:

> In the same way, however, it seems that one ought to agree that stars have the power to produce animals that are not too dissimilar, such as mice and bats, and any others of this sort that exist in kinds of animals. For although [animals] like these have instruments of motion, like wings and legs, they nonetheless have short and not very different ones. But for the reproduction of perfect animals, like the lion and the ox and the human, they seem to suffice in no way.[72]

The context of the calf passage implies that Albert regards the example demonstrating the possibility of the formation of a perfect animal as a valid argument; in fact, when he says that « the bodies of perfect animals are rarely formed in the cloud » the word *raro* itself signals that it is not impossible. However, it is also of importance that Albert twice emphasizes that the calf was dead. It should be interpreted perhaps as an indication that the generation was not really completed, that is, the power of the stars was sufficient for forming the body, but not for animating it.[73]

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[71] He discusses spontaneous generation in general or with regard to specific animals such as mice and worms in many works written both before and after the *Meteora* – cf. *Summa de creaturis* IV, 72, 2 (*Opera omnia*, ed. Borgnet, vol. XXXIV, p. 745–6); *Physica* VIII, 2, 10 (*Opera omnia*, ed. Coloniensis, vol. IV/2, p. 613); *De XV problematibus*, ch. VI (ed. Geyer, p. 38); *De causis propr.* II, 13 (*Opera omnia*, ed. Coloniensis, vol. V/2, p. 86); *De animalibus* VI, 3, 3 (ed. Stadler, p. 494–495); XVII, 2, 1 (on generation of worms, p. 1170); XXII, 2, 1.80 (on generation of mice, p. 1415).

[72] Albert the Great, *On the Causes of the Properties of the Elements (Liber de causis proprietatum elementorum)*, trans. Irven M. Resnick, Marquette University Press, Milwaukee 2010 (Mediæval Philosophical Texts in Translation, 46), p. 93. Cf. Albertus Magnus, *Opera omnia*, ed. Coloniensis, vol. V/2, p. 86: « Similiter autem consentiendum videtur stellas posse ad productionem animalium non multum dissimilium, sicut sunt mures et vespertiliones, et quidquid huiusmodi est in animalium generibus; licet enim huiusmodi instrumenta habeant motus sicut alas et crura, tamen brevia habent et non multum differentia. Sed in perfectorum animalium generatione, sicut est leo et bos et homo, nulla videntur sufficere ratione ».

[73] Cf. indications of short duration of monsters in his *De causis propr.* I, 2, 13: « But Averroes says that what is said about the stars is true in similar animals and he says that it is not true in dissimilar animals, because if by chance a shape is impressed by a star on some body or animal, it does not develop the strength for life, but is dead. For stones are found shaped in a human likeness and likewise monsters, which do not develop a strength for life, which nonetheless must arise from

On the other hand, it brings us to another recognizable and recurring motif – that of an animal falling from a height and dead before it reaches the ground. The cause of death is not the impact, but the dominance of the pure element of air in the upper region which a living animal cannot endure. This idea is borrowed from *De causis* of Pseudo-Aristotle which reads as follows:

> And likewise when one of the four elements prevails in an animal, it kills him. And when he is deprived of one of them, he does not abide. This is because if an animal is deprived of air, he does not endure. Likewise, when air prevails in him, it kills him, as, for example, that one who falls from a very high place, for he dies before he attains the earth.[74]

Albert explicitly referred to this work while introducing this view in his *De natura loci*[75] and repeated it with more details and arguments in *De causis et proprietatibus elementorum*:

> In the same manner, if simple air that is not somewhat dense occupied an animal, it would die, and an indication of this is that we see that those animals that fall from a very high place, where the air is pure, seem to die not from the fall but rather before they reach the ground. But the experiential evidence [experimentum] for this is twofold: there is of course one example that is observed in the art of climbing, for if one falling from a high place is deflected from the line of his fall, he will impact the ground only as hard as if he fell from the place where he received the deflection. For if someone should fall from a tower and someone else should intercept him three cubits before he falls to earth and should push him away with a hand transversely from the line of his fall from the tower, the one falling will impact the ground only as hard as he would have from a fall of three cubits. However, if he

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the power of the stars » (trans. RESNICK, p. 93–94). For the Latin text see *Opera omnia*, ed. Coloniensis, vol. V/2, p. 86–87: « Quod autem de stellis dicitur, verum esse dicit Averroes in animalibus similibus, et in animalibus dissimilibus non dicit esse verum, quod si figura forte imprimatur a stella alicui corpori vel animali, illud non convalescit ad vitam, sed est mortuum; lapides enim figurati effigie hominis inveniuntur et similiter monstra, quae non convalescunt, quod tamen virtute stellarum fieri est necesse ». On this passage see also VAN DER LUGT, *Le ver, le démon et la vierge*, p. 175–176.

74 STANLEY LUIS VODRASKA, *Pseudo-Aristotle: De causis proprietatum et elementorum: Critical Edition and Study*, Ph.D. Diss. masch., University of London 1969, p. 91–92: « Et similiter quando occupat unum istorum elementorum quattuor aliquod animalium, interficit ipsum. Et quando privatur uno eorum, non est remanentia ei. Quod est quia si aliquod animalium privatur aere, non est ei permanentia. Et similiter quando occupat ipsum aer, interficit ipsum, sicut illud quod ruit ex loco altissimo superiori, moritur enim antequam perveniat ad terram ».

75 ALBERTUS MAGNUS, *De natura loci* I, 2, in *Opera omnia*, ed. Coloniensis, vol. V/2, p. 3: « Propter quod egregie dicit Aristoteles in Libro de causis proprietatum elementorum et orbis sive planetarum, quod si compositum occupatur a simplici, corrumpitur statim, dans exemplum de his animalibus, quae cadunt ab altissimo, quae ante mortua sunt, quam ad terram deveniant, et ideo corrupta sunt, eo quod occupata sunt ab aere simplici et non a casu ».

> should fall from a very high place and be deflected from the line of the fall, he is still found dead. And for this reason it is known that he did not die from the fall but because he has been filled with simple air.[76]

Albert himself does not clarify as to how we should understand the indication that the calf was dead – as an evidence that the power of the stars could only form the body in the clouds, but not vivify it or that it was animated, but died being exposed to the pure element of air.

Thus, the calf example could well be used in the context of two very important motifs which Albert discusses many times at various places before and after composition of the *Meteora* – that of spontaneous generation and that of an [animated] body falling from the sky. The closest parallels are found in his treatise *De causis proprietatum elementorum* written before the *Meteora*. However, the calf example occurs only once in the section of the *Meteora* related to thunder and the substance which strikes from a cloud.

IV. *Avicenna*

The « explicit nominal » reference, as labelled by Amos Bertolacci,[77] to Avicenna incorporated into the calf story suggests, however, that Albert may have cited from some source, and at least for this reason we must consider Avicenna's writings that were available to Albert in order to verify if the calf episode occurs in any of them. The Latin translations accomplished before Albert's *Meteora* included two great works of Avicenna – the medicine encyclopaedia *Canon of Medicine* (*Qanūn fī l-ṭibb*) translated by Gerard of Cremona in the second half of the

[76] Albert the Great, *On the Causes of the Properties of the Elements*, trans. Resnick, p. 26. For the Latin text see *De causis proprietatum* I, I, 2, in *Opera omnia*, ed. Coloniensis, vol. V/2, p. 53: « Similiter, si aliquod animalium aer simplex occuparet, qui non esset crassus aliquantulum, moreretur, et huius signum est, quia videmus, quod ea quae cadunt ab altissimo, ubi purus est aer, videntur mortua non ex casu, sed potius antequam perveniant ad terram. Experimentum autem huius est duplex: unum quidem, quod observatur in arte scandendi, quoniam si cadens ab alto extrudatur a linea casus, non colliditur nisi tantum, quantum potest collidi ex loco, in quo recipit extrusionem; si enim aliquis a turri cadat et ei alius obviet per tres cubitos, antequam ad terram descendat, et eum manu ex linea casus a turri ex transverso eiciat, non colliditur cadens, nisi quantum potuit collidi ex casu trium cubitorum; si autem ab altissimo cadat et extrudatur a linea casus, tamen invenitur mortuus; et ideo constat, quod non ex casu mortuus est, sed quia a simplici aere fuerat occupatus. Aliud est experimentum, quod cadavera eorum inveniuntur cum signis mortis non ex collisione, quia forte ex casu non tumescunt vel non sanguinant neque cetera signa habent collisionis umorum. Hac de causa etiam in montes altissimos ascendentes spongias aquis intinctas ante nares secum portaverunt, ut per has spiratus crassior esset aer ».

[77] Amos Bertolacci, « The Reception of Avicenna in Latin Medieval Culture », in Peter Adamson (ed.), *Interpreting Avicenna: Critical Essays*, Cambridge University Press, Cambridge 2013, p. 242–269, at 254, where he distinguishes between this type of reference which explicitly names Avicenna, against « explicit indeterminate » quotation which involves « an indefinite description ».

12th century, and some parts of his compendium *Book of the Cure* (*Kitāb al-Shifā'*), executed at various times by various translators: that is, the Introduction and the Prologue, logical treatises, *Liber primus naturalium*, *De anima*, *De animalibus*, and the already mentioned *De mineralibus* and *De diluviis*.[78] Many other treatises such as *De caelo*, *De generatione et corruptione*, *De Actionibus et Passionibus Qualitatum Primarum*, and *De plantis* were made accessible to the Western audience later and could not have been consulted by Albert during his work on the *Meteora*.

Since the calf story appears in Albert's *Meteora*, it is reasonable to start with the Latin treatises derived from Avicenna's *Meteorology*.[79] This part of *Kitāb al-Shifā'* was translated in its entirety by Johannes Gunsalvini and Salomon in Burgos after Albert's *Meteora* had already been composed, but in Albert's times translations of two fragments were known – a treatise *De mineralibus* or *De congelatione et conglutinatione lapidum* which we have mentioned above in connection with the translations of Aristotle's *Meteorology*, and a short treatise *De diluviis*.[80] In *De mineralibus*, Avicenna addresses the formation of stones and mountains, offers a four-fold classification of minerals and expresses his sceptical view on the possibility of a real alchemical transmutation. He illustrates his arguments with numerous examples, the most interesting of which for the present study are those relating to meteorites. Thus, he conveys that thunderbolts fell with the lightning in several places, e.g. in Persia, and that they could not be liquefied, but turned into ashes. A heavy lump of iron fell once from the sky; it could hardly be crushed, and a part of it was brought to a king who ordered to make swords from it, but it was not malleable; it consisted of small particles coalescing with each other like big millet grains; and it is said that some of the best swords are made from similar matter. Another such mass fell somewhere else. The Latin translation, distorted and abridged as it is, preserves these examples.

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78 See Ibid., 244–249.

79 On the Latin translations of this part see Jean-Marc Mandosio, Carla Di Martino, « La *Météorologie* d'Avicenne (Kitāb al-Shifā' V) et sa diffusion dans le monde latin », in Andreas Speer, Lydia Wegener (eds.), *Wissen über Grenzen: Arabisches Wissen und lateinisches Mittelalter*, De Gruyter, Berlin – New York, 2006 (Miscellanea Mediaevalia, 33), p. 406–424, and Silvia Di Donato, « Les trois traductions latines de la Météorologie d'Avicenne: notes pour l'histoire du texte », *Documenti e studi sulla tradizione filosofica medievale*, 28 (2017), p. 331–349.

80 *De mineralibus* was translated by Alfred of Shareshill. The previous editions are now superseded by Elisa Rubino, Samuela Pagani, « Il *De mineralibus* di Avicenna tradotto da Alfredo di Shareshill », *Bulletin de Philosophie Médiévale*, 58 (2016), p. 23–87. For the *De diluviis* text see still Manuel Alonso Alonso, « Homenaje a Avicena en su milenarios: Las traducciones de Juan González de Burgos y Salomón », *Al-Andalus*, 14/2 (1949), p. 291–319. There are good reasons to assume that *De diluviis* was translated by Michael Scot, see Hasse, Andreas Büttner, « Notes on Anonymous Twelfth-Century Translations of Philosophical Texts from Arabic into Latin on the Iberian Peninsula », in Hasse, Bertolacci (eds.), *The Arabic, Hebrew and Latin Reception,* p. 313–369, at 346–347.

Albert abundantly refers to and cites from Avicenna's *De mineralibus* in various treatises – for the most part in his work of the same title,[81] but also in the *Meteora*. It is remarkable that in his *De mineralibus* Albert explicitly mentions only one example from Avicenna: while arguing that stones can be produced by river banks, he illustrates this point by referring to the river Gion where it takes thirty three years for stones to be formed.[82] The second case is not an example in the strict sense, but rather a partial retelling or allusion to some details in Avicenna's account. In the same chapter of the *Meteora* which contains the calf episode, just before and after it, Albert tells that if a mineral falls from the cloud it is mostly of iron and that an iron mass falling from the cloud is distilled from inside the cloud in the form of drops and for this reason is composed as if of millet grains.[83] After the calf story, he adds that the minerals that fall [from the clouds] are so dried out that they cannot be liquefied and are not fabricable, but when put into fire, evaporate into ashes.[84] These allusions evidently go back to Avicenna's text, but are detached from his examples, which makes them look like theoretical generalizations. There is nothing, however, either in the original text of Avicenna or in its Latin translation that resembles the story of a dead calf body falling from the sky. Nevertheless, it is very interesting that the generalized conclusions extracted from Avicenna's examples without references to the author frame the calf story which is attributed to Avicenna.

Another fragment of the *Meteorology* from *Kitāb al-Shifā'* was translated into Latin before the mid-thirteenth century by an anonymous translator and known under the title *De diluviis*. Though very short, even tiny, it was one of the most important works on spontaneous generation which was commented on and polemized with throughout the Middle Ages and Renaissance as we have seen in the first part of this article. Here Avicenna, referring to Plato's Timaeus, enunciates his theory on the floods which can be caused by the redundancy not only of water, but also of the other three elements. The crucial factor is a specific alignment of stars. After the extinction of life forms due to such floods they can be re-created not through reproduction (*gignitio*), but through generation (*generatio*), just as snakes come from the hair, scorpions from the figs, mice from the earth and frogs from the rain. It is not impossible, therefore, that all composite beings could be brought forth through the composition of the elements and not through

[81] Albertus Magnus, *De mineralibus* I, 1, 1; I, 1, 7; I, 2, 8; III, 1, 6; III, 1, 9; IV, 2; IV, 3; V, 1, in *Opera omnia*, ed. Borgnet, vol. V. Cf. corresponding places in English translation by Dorothy Wyckoff (Albertus Magnus, *Book of minerals*).

[82] *De min.* I, 1, 7, borrowed from Avicenna's *De min.*, ed. Rubino – Pagani, p. 35.

[83] Albertus Magnus, *Meteora,* in *Opera omnia*, ed. Coloniensis, VI/1, p. 171: « Et quia cum congelatur frigido, congelatur in interioribus nubis et per modum guttarum distillat ab interiori vapore, ideo est massa sicut ex granulis milii et ceteris composita ».

[84] Ibid., p. 172: « Mineralia autem, quae cadunt, adeo sunt exsiccata, quod nec liquescunt, nec fabricabilia sunt; sed cum in ignem ponuntur, evaporant in cineres ».

reproduction. Astronomers argue that if some alignments of the stars had not produced individuals of the species, these species could cease to exist without renewal. And a man does not necessarily come into being through another man.

This text shares many common points with the calf story which could indeed serve as a perfect illustration to the theory of spontaneous formation of « higher » animals under the influence of the stars. Nevertheless, it is not to be found in the treatise. It is important to note here that Albert was very well aware of Avicenna's authorship of the *De diluviis*. He mentions it with the reference to Avicenna in the *Summa de creaturis*[85] and gives a very detailed survey in the *De causis propr*. I, 2, 13, which I have already touched upon above.[86] Thus, it can be stated that the two fragments of Avicenna's *Meteorology* undoubtedly known to Albert and many times cited and discussed in his own treatises do not contain anything similar to the calf example, although they demonstrate a considerable degree of overlapping of some general ideas and notions.

Avicenna devotes considerable space to spontaneous generation in his *De animalibus* translated into Latin by Michael Scot before 1236.[87] He relates of bombyxes that appeared in a great multitude in a town after the rain, of scorpions which his friend « made » so that they produced other scorpions after that, of a beaver found in a stream that came into existence recently and was far away from the sea, of fishes that occur in recently dug ditches, but nothing of a calf.[88]

Searching through the other texts by Avicenna available to Albert in Latin translations brought also no results. Moreover, it seems that the whole corpus of Avicenna's writings does not include a story of the calf falling from the sky in any form, or at least I was unable to find any evidence. It could also be surmised that the example occurs not in Avicenna, but in some commentaries which could have been confused with the main text, e.g., in the commentaries of Alfred of Shareshill, especially since there are reasons to assume that Albert was acquainted with these glosses.[89] However, the result is likewise negative.

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85 Albertus Magnus, *Summa de creaturis* tr. IV, q. 72, art. 2, in *Opera omnia*, ed. Borgnet, vol. XXXIV, p. 745–746.

86 Cf. Di Donato, « Les trois traductions latines », p. 337; the statement in Mandosio, Di Martino, « La *Météorologie* d'Avicenne », p. 420, that the Latin translation should have been made before 1250–1254 « puisque Albert le Grand la cite à diverses reprises dans son ‚De mineralibus', sans savoir qu'il s'agit d'un texte d'Avicenne » is inaccurate since *De causis propr*. was written before the *De mineralibus*, and there is no doubt that Albert properly recounts there the doctrine of Avicenna as expounded in the *De diluviis* with a due reference to Avicenna.

87 Cf. Bertolacci, « The reception of Avicenna », p. 246–247.

88 See Avicenna, *De animalibus per magistrum Michaelem Scotum de arabico in latinum translatus*, Venetiis [*c.* 1500], fol. 47v. Albert retells some of these examples in his *De animalibus* XV, 1, 8 (ed. Stadler, p. 1009).

89 Elisa Rubino, « The Commentary of Alfred of Shareshill on the Pseudo-Aristotelian *De mineralibus* », *Documenti e studi sulla tradizione filosofica medievale*, 28 (2017), p. 351–364, at 354.

Finally, one must take into account pseudo-Avicennian writings, such as *De caelo et mundo*[90] and alchemical treatises *Ad Hasen Regem Epistula* and *De Anima in arte alchemiae*, which Albert often refers to in his works. However, although these texts sometimes discuss issues which are very close to the bundle of motifs behind the calf example – for instance, the possibility of formation of living beings from non-living entities and, actually, the very possibility of transmutation – they do not mention the fall of the calf.[91] Thus, so far I have not been able to find any evidence of the motif in the works written by or associated with Avicenna.

V. *Averroes*

We have seen that some humanists who obviously could not find the source of the citation in the works by Avicenna suggested that it was Averroes who might have been responsible for this confusion. This opinion was in a way accepted in the latest edition of Albert's *Meteora* since the passage on the calf is provided with a reference « cf. Averroes, Meteora 1.2 c.4 (f.45D) ». In this commentary, Averroes considers the problem of thunder and lightning (*De tonitruis, fulminibus et fulguribus*) – a very close parallel to Albert the Great's discussion of the same topics where the calf story appears.[92] Here, Averroes argues at length that lightning and thunder have the same cause in violent winds which, in case of the lightning, get inflamed through their own velocity. He mentions Avicenna only to retell his account of the stones he had found in the lands of Casaam and Turch, but then, in the Latin translation, he adds that such things were never seen in « our lands » and nobody of the Peripatetics remembered it, but according to Avicenna a big stone fell once in Cordoba, fiery on a serene and clear day and that Avicenna saw it with his own eyes, and it had a sulphurous smell and was quasi of the nature of ammoniacum, and it was not far away.[93] This addition looks very suspicious since

[90] See Pseudo-Avicenna, *Liber celi et mundi: A Critical Edition with Introduction*, ed. Oliver Gutman, Brill, Leiden 2003 (Aristoteles Semitico-Latinus, 14); Albert used the *Liber Celi et Mundi* in his work and attributed it to Avicenna, see Oliver Gutman, « On the Fringes of the *Corpus Aristotelicum*: The Pseudo-Avicenna *Liber Celi et Mundi* », *Early Science and Medicine*, 2/2: *Medieval Cosmologies*, p. 109–128, at 113.

[91] Calf or cow do occur in the occult or alchemical texts, but mostly in another function – as material for bees, see, for example, Liana Saif, « The Cows and the Bees: Arabic Sources and Parallels for Pseudo-Plato's *Liber Vaccae* (Kitāb al-Nawāmīs) », *Journal of the Warburg and Courtauld Institutes,* 79 (2016), p. 1–47.

[92] I have used the edition *Aristotelis Stagiritae Omnia, Qvae Extant, Opera: Aristotelis Opera cum Averrois commentariis*, vol. V: *Aristotelis De coelo, De generatione et corruption, Meteorologicorum, De plantis cum Averrois Cordubensis variis in eosdem commentariis*, apud Junctas, Venetiis 1562, fol. 446r–447r.

[93] Ibid.: « Et narrauit Auicenna quod aduenit ex terrestreitate huius exhalationis in terris Casaam, et in terris Turch, quod inuenitur in locis, in quibus cadunt ista fulmina, corpora similia ferro, et airi: et quod ipse laborauit liquefacere ipsum, seu accendere illud, et non potuit: sed dissoluebatur, et conuertebatur in ignem, donec priuatum fuit. et haec res non fuit visa in terris

in the treatise Averroes obviously refers to, Avicenna does not record anything similar or corresponding in details to Averroes's description – he does not mention either the sulphurous smell of any meteor, or its fiery appearance in the clear sky, and of course he had never been to Cordoba so that he could not possibly have described the event as an eyewitness. The dubiety of the passage was noted by Manuel Alonso Alonso who suggested a distortion in the Latin text or scribal errors in the names of Cordoba or Avicenna.[94] Indeed, the Arabic original of the *Epitome* refers for the story of the Cordoban stone not to Avicenna, but to the Cordoban historian Ibn Ḥayyān (d. 1076) so that it is an obvious error of the Latin translation.[95] It is interesting that Averroes's criticism of Avicenna in his *Epitome* is quite calm in tone and actually oblique, in contrast to his harsh attacks elsewhere.[96] However, we find no calf in this passage of Averroes.

Perhaps, we should consider another passage from the same Commentary which seems to be more suitable or more closely resembling some motifs of the calf citation. Speaking of the winds which play a central part in this section on lightning and thunder, Averroes remarks that whirlwinds and storm winds have such a strength that they elevate ships and animals and throw them down in another place.[97] This description very probably goes back to Alexander of

nostris, neque aliquis de secta Peripateticorum memorauit hoc. Sed narrauit Auicenna quod lapis magnus cecidit in Corduba, igneus in die sereno, seu claro, et quod ipse vidit illum lapidem, et habuit odorem sulphuris, et quasi naturam ammoniaci. et hoc non est remotum ».

94 Manuel Alonso Alonso, « Averroes, observador de la naturaleza », *Al-Andalus*, 5 (1940), p. 223, fn. 3.

95 See Ibn Rušd, *Risālat al-Āṯār al-ʿulwiyya*, ed. Rafīq al-ʿAǧam, Ǧīrār Ǧihāmī, Dār al-fikr al-lubnānī, Beirut 1994, 66. I am grateful to Vera Tsukanova for her help with the Arabic text. See also Paul Lettinck, *Aristotle's Meteorology and Its Reception in the Arab World: With an Edition and Translation of Ibn Suwār's Treatise on Meteorological Phenomena and Ibn Bājja's Commentary on the Meteorology*, Brill, Leiden, 1999 (Aristoteles Semitico-Latinus, 10), p. 239–240. Curiously, the error of the Latin translation is uncritically reproduced in the historical astronomy. Thus, María José Martínez Usó, Francisco J. Marco Castillo, « A Survey of Meteoric Activity over Spain during the Eighth–Fifteenth Centuries », *Journal for the History of Astronomy*, 47/2 (2016), p. 168–193, adduce this example from the Latin translation of Averroes immediately after the meteorite mentioned by Ibn Ḥayyān as seen in 973. On Averroes' criticism of Avicenna in *Meteorology* see Cristina Cerami, « A Map of Averroes' Criticism against Avicenna: *Physics, De caelo, De generatione et corruptione* and *Meteorology* », in Dag Nikolaus Hasse, Amos Bertolacci (eds.), *The Arabic, Hebrew and Latin Reception of Avicenna's Physics and Cosmology*, De Gruyter, Berlin – New York 2018 (Scientia Graeco-Arabica, 23), p. 163–240, at 212–231, and esp. 227–228.

96 On the sceptical attitude of Averroes see Amos Bertolacci, « Averroes against Avicenna on Human Spontaneous Generation: The Starting-Point of a Lasting Debate », in Anna Akasoy, Guido Giglioni (eds.), *Renaissance Averroism and its Aftermath: Arabic Philosophy in Early Modern Europe*, Springer, Dordrecht 2013 (Archives internationales d'histoire des idées, 211), p. 37–54.

97 Ibid., fol. 446v: « Et omnes isti venti circumeuntes vocantur venti vertiginosi, et tempestuosi: et isti sunt venti fortes, ex quorum fortitudine accidit eleuare naues, et animalia, et proijcere illa ad locum alium ».

Aphrodisias,[98] and was, as we have seen, readily repeated later by Averroists to explain away the calf phenomenon. And still, it brings us no closer to understanding the origin of this citation.

But the greatest problem is that by Albert's time only one of Averroes's Commentaries on Aristotle's *Meteorology* had been translated, namely, on Book IV, and the rest became available to the Latin reading audience no sooner than in the late 15th century when Elia del Medigo translated commentaries on the Books I-III. [99] Thus, Albert could not possibly have known the part of Averroes's Commentaries which discusses the problem of thunder and lightning.

If we look for similar themes and motifs from Averroes's works that were undoubtedly known to Albert, we cannot miss Averroes's discussion of Avicenna's theory of spontaneous generation. In *De causis propr.* I, 2, 13 briefly discussed above, Albert expounds the dispute on the floods and re-creation of species between Avicenna and Averroes. After summing up Avicenna's position, he proceeds to unveil Averroes's counterarguments aimed at demonstrating that perfect animals « cannot be restored by the stars and the elements alone ». [100] In Albert's presentation, there are three main reasons, namely, 1) that perfect animals necessarily need a place where a semen could develop, that is, the uterus; 2) that this spontaneous regeneration of perfect animals should theoretically be a rather frequent phenomenon, but such cases have been never reported by anyone; 3) since the principle of economy or efficacy predominates in nature, there would be no need for sexual reproduction. Albert adopts a middle position by noting that both authorities have points to agree with. His approach lies in moving the demarcation line which differentiates one kind of animals from another. Avicenna does not exclude the possibility of spontaneous generation for all animals, and Averroes, according to Albert, completely denies such possibility for all the perfect animals which are characterized by « a great diversity in their members ».[101] But Albert includes into the category of animals capable of spontaneous generation

[98] For the Greek text see ALEXANDER APHRODISIENSIS, *In Aristotelis Meteorologicorum libros commentaria*, ed. MICHAEL HAYDUCK, Reimer, Berlin 1899, p. 136; cf. the Latin translation by Willam of Moerbeke in ALEXANDRE D'APHRODISIAS, *Commentaire sur les Météores d'Aristote: Traduction de Guillaume de Moerbeke*, ed. ALFONS J. SMET, Leuvense Universitaire Uitgaven, Leuven 1968 (Corpus latinum commentariorum in Aristotelem graecorum, 4), p. 216: « Propter quod ex mari frequenter quidem aquam trahit, iam autem alicubi et navem elevavit, coassumens revolutioni. Ex terra autem et lapides et alia quaedam elevavit, iam autem et animalia » .

[99] See DAG NIKOLAUS HASSE, *Latin Averroes Translations of the First Half of the Thirteenth Century*, Olms, Hildesheim 2010, p. 28–29; MARC GEOFFROY, « Ibn Rushd (Averroes), Latin Translations of », in *Encyclopedia of Medieval Philosophy: Philosophy between 500 and 1500*, ed. HENRIK LAGERLUND, Springer, Dordrecht 2011, p. 501–507. The translation of the Book IV is sometimes attributed to Michael Scot, but there seems to be not enough grounds for this assumption, see HASSE, *Latin Averroes Translations*, 28–29.

[100] ALBERT THE GREAT, *On the Causes of the Properties of the Elements*, trans. RESNICK, p. 92.

[101] Ibidem.

some small 'perfect' animals, such as mice and bats, pointing out that it is impossible for more perfect animals such as lions, oxen and men.[102] This seems to differ from Albert's earlier position expressed in his *Physica* VIII.2.10 where he criticizes Averroes, showing that his views logically imply the possibility of human spontaneous generation.[103] It is, however, to be questioned if Albert is endorsing this stance himself and not just summarizing Averroes's argumentation demonstrating its logical implications.

Further on, Albert mentions two more objections by Averroes, one being that there are no universal floods which would destroy all living beings on the earth, and the other deserves our closest attention, for it has many points in common with our topic.

> But Averroes says that what is said about the stars is true in similar animals and he says that it is not true in dissimilar animals, because if by chance a shape [*figura*] is impressed by a star on some body or animal, it does not develop the strength for life, but is dead. For stones are found shaped in a human likeness and likewise monsters, which do not develop a strength for life, which nonetheless must arise from the power of the stars. (trans. by Resnick, p. 93–94)

Here one finds a constellation of motifs, in many ways resembling the calf passage: the stars can impress an animal form on matter, but in case of an impression of an animal form which is dissimilar, it cannot live.[104] This argument, as many others in Albert's recount, more or less corresponds to the actual views of Averroes on spontaneous generation and his criticism of Avicenna expressed first of all in his Commentaries on *Physics* and *Metaphysics*.[105] Here, in particular, one can point to a similar mention of monstruosity by Averroes, who wrote that « therefore no species occurs by chance, but those which occur by chance are monsters, not natural [beings] ».[106] However, as pointed out by van der Lugt,[107] some of these arguments cannot be found in Averroes's works, but occur in the

[102] Ibid., p. 93: « In the same way, however, it seems that one ought to agree that stars have the power to produce animals that are not too dissimilar, such as mice and bats, and any others of this sort that exist in kinds of animals. For although [animals] like these have instruments of motion, like wings and legs, they nonetheless have short and not very different ones. But for the reproduction of perfect animals, like the lion and the ox and the human, they seem to suffice in no way ».

[103] Hasse, « Spontaneous Generation », 164.

[104] On the stars and on the development of Averroes's position see Gad Freudenthal, « The Medieval Astrologization of Aristotle's Biology: Averroes on the Role of the Celestial Bodies in the Generation of Animate Being », *Arabic Sciences and Philosophy*, 12 (2002), p. 111–137.

[105] See Bertolacci, « Averroes against Avicenna »; Cerami, « A Map of Averroes' Criticism »; Hasse, *Urzeugung und Weltbild: Aristoteles – Ibn Ruschd – Pasteur*, Olms, Hildesheim, 2006; Id., « Spontaneous Generation ».

[106] *Aristotelis opera cum Averrois commentariis*, vol. IV, apud Junctas, Venetiis 1562, fol. 387r: « et ideo nulla species invenitur casu [i.e. spontaneously], sed illa quae inveniuntur casu, sunt monstruosa, non naturalia ». Cf. esp. Hasse, « Spontaneous Generation », p. 162.

[107] van der Lugt, *Le ver, le démon et la Vierge*, p. 172–173.

writings of earlier Latin scholars, for example, Roland of Cremona so that it appears plausible that Albert attributed them to Averroes or borrowed from a text which contained such an attribution.[108] It is instructive that in his later work *De XV problematibus* Albert again invokes the distinction between perfect and imperfect animals with regard to the ability of the latter to be generated from the putrefaction with the explicit reference to Averroes's Commentary on the 1st book of *Metaphysics*.[109] A few lines below in the same passage he reiterates his argument that the most perfect animals cannot be generated through the stars alone. However, this time he does not mention Averroes, but ascribes this opinion generally to « philosophy ».[110]

Thus, although it is conceivable that Averroes could easily distort a phrase or formulation of Avicenna in order to attack him more violently,[111] this appears not to be the case here. The hypothesis of the Renaissance scholars that the calf story could ultimately go back not to Avicenna, but to Averroes, finds no confirmation. On the other hand, the absence of any mention in Averroes can be regarded as an indirect evidence that the story does not appear in Avicenna's writings. Given Averroes's attitude to Avicenna, he would certainly not have missed the opportunity to defame his perpetual opponent and to deride this fabulous example if he would have come across something similar in Avicenna's writings.

VI. *Parallels*

The picture would not be complete without considering some parallels, which have no direct connection to the calf story, but nevertheless demonstrate that a calf and its fall from heaven is not an isolated motif in the medieval thought.

Celestial phenomena are frequently linked to animals. A kind of meteorites was known as « goats ».[112] Al-Qazwīnī, referring to al-Jāḥiẓ, describes a dark cloud from which as if a camel's low was heard and which poured down frogs and thick fishes.[113] Barhebraeus, in his compendium completed in 1286, states that he has seen « large stones of hail which fell in the shape of horns and heads of oxen, sheep

[108] Ibidem.

[109] Albertus Magnus, *Opera omnia*, ed. Coloniensis, vol. XVII/1, p. 38: « Homo autem, sicut nec aliquod perfectorum animalium non est de his quae nasci possunt per putrefactionem, sicut dicit Averroes super XI Metaphysicae ».

[110] Ibidem: « Si forte dicat, quod ex constellatione diversae generationes fiant in diversis habitationis principiis, hoc iterum est contra philosophiam, quae dicit perfectissima animalia ex solis constellationibus nasci non posse ».

[111] See e.g., Bertolacci, « Averroes against Avicenna », p. 43–44.

[112] For the use of this word by Aristotle, Avicenna and Averroes see Lettinck, *Aristotle's Meteorology*, p. 18, 66, 81, 89.

[113] Al-Qazwînî, *Die Wunder des Himmels und der Erde,* trans. Alma Giese, Thienemann, Edition Erdmann, Stuttgart 1986 (Bibliothek arabischer Klassiker, 11), p. 38.

and horses ».[114] Muḥammad Ibn Mūsā Al-Ṭālishī (late 15th cent.) mentions even a « common parlance about 'stones and animals falling' in rain ».[115] Here I will discuss, however, only two topics which seem to have more in common with the subject of the paper than the various accounts of falling frogs and worms that abound in medieval treatises and chronicles and, of course, also remind of the 10 plagues of Egypt.[116]

VI.1. The calf and the log

Examples involving a calf are frequent in discussions of God's power and its limits. The most common case is the transformation of a log into a calf. Thus, in his *Regulae theologicae*, Alanus ab Insulis draws a distinction between two kinds of impossible things – for an inferior and for a superior reason.[117] What violates the natural course of things is impossible for an inferior reason, e.g. a virgin giving birth. Something which is impossible for a superior reason is what cannot be accomplished by God, e.g. God cannot make Himself not good. All that is impossible for a superior reason is also impossible for an inferior reason, but not *vice versa*. He gives then the following example:

> It is impossible for a log to be a calf by the law of nature, but God would be able to remove the nature of a log from its subject and imprint to it the nature of a calf; if it is done, the log ceases to be a log and begins to be a calf; although such an action is against nature, when it happens, what had previously been a log naturally, now would be a calf against nature.[118]

[114] Hidemi Takahashi, *Aristotelian Meteorology in Syriac: Barhebraeus, Butyrum Sapientiae, Books of Mineralogy and Meteorology*, Brill, Leiden 2004 (Aristoteles Semitico-Latinus, 15), p. 147.

[115] Hidemi Takahashi, « A Treatise on Meteorology By Muḥammad Ibn Mūsā Al-Ṭālishī (Ms. Daiber Collection II, 82) », in Anna Akasoy, Wim Raven (eds.), *Islamic Thought in the Middle Ages: Studies in Text, Transmission and Translation, in Honour of Hans Daiber*, Brill, Leiden 2008 (Islamic Philosophy, Theology and Science: Texts and Studies, 75), p. 363–401, at 383.

[116] I am thankful to the anonymous reviewer who reminded me of this evident example which I overlooked.

[117] Alanus ab Insulis, *Regulae de sacra theologia*, in *Patrologia Latina* 210, col. 648: « Reg. LVIII Omne impossibile secundum inferiorem causam, ad quod sequitur impossibile secundum superiorem, est impossibile Deo ».

[118] Ibidem: « Truncum enim esse vitulum est impossibile secundum legem naturae; posset tamen Deus naturam trunci a subjecto removere, et vituli naturam ei imprimere; quod si fieret, truncus desineret esse truncus et inciperet esse vitulus; licet hoc fieri sit contra naturam, tamen cum factum esset, quod prius naturaliter erat truncus, nunc contra naturam esset vitulus ». Cf. in the similar context his *Quoniam homines*, 86 (Palémon Glorieux, « La somme 'Quoniam homines' d'Alain de Lille », *Archives d'Histoire Doctrinale et Littéraire du Moyen Âge*, 20 (1953), p. 113–364, at 230): «Item queritur cum Deus de albo potest facere nigrum et de trunco vitulum... ».

Here we find an analogy between the miraculous virgin birth and another supernatural event involving a calf, not very different from a similar analogy proposed in *Defensorium* by Franz von Retz. Another common point is the notion of impression: God imprints the nature of a calf onto a log just as celestial bodies imprint the form of a calf on the matter within a cloud. This discussion and example were reproduced by Simon of Tournai.[119] Giles of Rome took advantage of this hypothetical miracle in connection with Christ's conception and birth.[120] He addresses the question in what respect it is natural and in what miraculous, and elaborates a four-partite scheme of possibilities: 1. Generation takes place from a natural substance through a natural agent, which is completely natural as the generation of a child by its parents. 2. Generation from an unnatural substance through an unnatural agent, which is completely miraculous as the generation of the first man from the dust of the ground by the divine power. 3. Generation from a natural substance through an unnatural agent, and this is exactly the case with Christ's conception; therefore it is completely miraculous, but in a certain respect (that of the substance) natural. 4. The fourth possibility – generation from an unnatural substance through a natural agent – is purely theoretical because it is impossible. Then he adduces the example of a log and a calf to show that generation from an unnatural substance may be caused only by an unnatural agent: « A calf, however, could become from a log, which is not a natural substance of a calf, through the divine power ».[121]

VI.2. The golden calf

Another parallel that immediately suggests itself is the story of the golden calf. William of Auvergne, Bishop of Paris, in his treatise on the laws (*De legibus*) considers it at length, mentioning a number of opinions as to why the idol created by Aaron was in form of a calf and not in any other shape. According to William, some believed that it occurred regardless of Aaron's intentions, because the sign of Taurus was rising and its head ascending. They share the opinion of those who attribute all animals' shapes to the celestial bodies. Others say it was a deliberate choice by Aaron who had in mind Serapis – an Egyptian deity adored in the form of a bull. Still others think that in this calf they venerated the celestial bull – their proper sign according to some professors of astronomy who considered Taurus to be the sign of the Jews just like Saturn to be their planet. William himself finds this

[119] NIKOLAUS M. HÄRING, « Two Redactions of a Commentary on a Gallican Creed by Simon of Tournai », *Archives d'Histoire Doctrinale et Littéraire du Moyen Âge*, 41 (1974), p. 39–112, at 50 and 88.

[120] AEGIDIUS COLUMNAE ROMANUS, *In tertium librum sententiarum eruditissima commentaria cum quaestionibus*, ex typ. Alexandri Zannetti, Romae 1623, p. 127.

[121] Ibidem: « Posset tamen virtute diuina de trunco, qui non est naturalis materia vituli, fieri vitulus ».

view more plausible,[122] but for the present study, the mention of the link between animal shapes and celestial bodies is significant.

A most interesting interpretation of the story, although related not to Aaron's, but to Jeroboam's golden calves (I Kings 12:25–33), appears in Mishnah (Sota 47a = Snh. 107b). In the mishnaic account, Gehazi, a corrupt servant of Elisha, « put a magnet over the casts made by Jeroboam, and they were suspended in the air ».[123] One finds another mention of a levitating calf in the talmudic discussion of sorcery (Snh. 7):

> Yannai said, I was walking on a road in Sepphoris when I saw a Minean taking a pebble, throwing it into the air, after which it came down transforming itself into a calf. But did not Rebbi Eleazar say in the name of Rebbi Yose ben Zimra: If all people of the world came together, they could not create one mosquito and bring it to life. Let us say that this Minean did not take a pebble, threw it into the air, after which it came down transforming itself into a calf, but he called on his genie who stole a calf for him from a cattle barn and brought it to him.
>
> Rebbi Hinena ben Hanania said: I was promenading at Gufta of Sepphoris when I saw a Minean taking a skull, throwing it into the air, after which it came down transforming itself into a calf. I went and told it to my father. He said, if you ate from it, it was an action; otherwise it was an illusion.[124]

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[122] Guilelmus de Alvernia, *Opera omnia*, t. I, apud Dionysium Thierry, Paris 1674, p. 83: « Nonnulli autem credunt, quia pro eo exivit forma vituli, quod tauri signum erat in ortu et caput eius ascendebat. Et hi sunt de opinione eorum, qui omnes figuras animalium coelestibus corporibus attribuunt. Aliis autem videtur, quia formam vituli conflari sibi petierunt ab Aaron, et hoc propter consuetudinem Aegyptiae idolatriae, ubi adorabatur Serapis, qui in forma tauri consueverat apparere Aegyptiis [...] aliis enim videtur, quod in vitulo illo conflatili colere intenderent taurum coelestem, id est signum, de quo fecimus mentionem, tanquam proprium signum suum, et a quo tota fortuna et infortunium eorum penderet; opinati namque sunt aliqui ex astronomiae professoribus taurum signum esse regis, et legis Hebraeorum, quemadmodum et Saturnum planetam eorum, de quo supra fecimus mentionem. Stellae quoque Saturni veneratio et cultura apud barbaros mirabiliter inolevit antiquitus et adhuc apud spurcissimas gentes et barbarissimas Gog scilicet et Magog viget, atque generaliter observatur, unde et lingua sua vocant eum marcholon, id est stellam Deorum. Verisimile autem est hoc, quod in idolo illo tauri vel vituli coleretur taurus coelestis ». On the passage in the context of medieval doctrine of *impressio* cf. Weill-Parot, *Les 'images astrologiques' au Moyen Âge et à la Renaissance: spéculations intellectuelles et pratiques magiques (XII^e^–XV^e^ siècle)*, Honoré Champion Éditeur, Paris 2002 (Sciences, techniques et civilisations du Moyen Age à l'aube des Lumières, 6), p. 193–194.

[123] Translation by Michael L. Rodkinson, *New Edition of the Babylonian Talmud*, vol. VII–VIII, New Talmud Publishing Company, New York 1902, p. 349. Cf. Immanuel Löw, « Review of Edmund O. von Lippmann, Geschichte der Magnetnadel bis zur Erfindung des Kompasses (gegen 1300), Berlin, 1932 », *Monatsschrift für Geschichte und Wissenschaft des Judentums*, 76 (40)/4 (1932), p. 456–463; Bernhard Heller, « Zu S. 456–463 », *Monatsschrift für Geschichte und Wissenschaft des Judentums*, 77(41)/1 (1933), p. 61–63.

[124] Heinrich W. Guggenheimer (ed.), *The Jerusalem Talmud. Fourth Order: Neziqin. Tractates Sanhedrin, Makkot, and Horaiot*, De Gruyter, Berlin 2010 (Studia Judaica: Forschungen zur Wissenschaft des

Of course, these accounts differ from the calf story if only because it involves an object (pebble or skull) thrown up into the air and it is not clear at which moment the transformation takes place. Nevertheless, with all the differences in details, these anecdotes are the closest parallels to Albert's calf example I have come across so far. I am unaware of any reception of this tradition in Latin texts, but there is a curious pictorial parallel from around 1500. A follower of Filippino Lippi depicted what is believed to be a scene of worship of the Egyptian Bull God, Apis (now in the National Gallery, London) (Fig. 2, below).[125]

The image of a calf levitating in the air is very similar to the representation of the calf story in *Defensorium* (see above); on the other hand, the moon symbol is reminiscent of the moon-calf mentioned by Wilkins. One can only speculate on the sources used by the artist, but the fact is that it is a very rare visual depiction of a flying calf / bull motif which finds its closest cognate in illustrations of block-books with Franz of Retz's text which are chronologically not very far from the dating of this picture.

VII. *Conclusion*

As demonstrated above, the calf story played a central role in late medieval and humanistic discussions of spontaneous generation. Although the references given by different authors may vary, their ultimate source was Albert the Great who in his turn attributes it to Avicenna. For this reason, the attitude to the story came to be indicative of the attitude to Avicenna's views on spontaneous generation and his philosophy in general: those who sided with Averroes in his criticism usually derided the calf example as nonsense. However, it is most probable that the Avicenna attribution is ungrounded and therefore the scorn of the later scholars was in fact directed not against Avicenna, but towards Albert. But where did Albert borrow this citation from, is an open question. I have not been able to find any direct parallels in magical, alchimical, astrological, natural philosophical sources or in secondary literature.

It is already puzzling that the story occurs only in the *Meteora* in the discussion of the lightning and is not mentioned in any other place directly pertaining to the issue of animal generation. In this connection, it may also be noted that the most prominent scholars who were either Albert's students or his followers – the most outstanding examples being Thomas Aquinas and Conrad of Megenberg – do not ever refer to Avicenna's calf. Perhaps, they were critical enough to recognize the spuriousness of the citation, but preferred to pass over it in silence – out of

Judentums, 51), p. 283; cf. also Arthur Marmorstein, « Beiträge zur Religionsgeschichte und Volkskunde », *Jahrbuch für jüdische Volkskunde*, 25 (1923), p. 280–319.

[125] London, National Gallery, Follower of Filippino Lippi, *The Worship of the Egyptian Bull God Apis, c.* 1500.

reverence to their teacher. Indeed, the mention of the calf story appears in the *Summa* by Albert of Orlamünde, who merely epitomized the texts by Albert the Great, but this is to my knowledge the only instance of a chronologically immediate reception of the story which seems not to enter the scholarly and popular discourse until the 14th century, and this gap is perhaps telling. Thereafter, the calf example makes its way into such fields as alchemy and popular miracle literature and re-appears with full force in humanistic studies, this time very soon as a punching bag.

Although some more or less similar motifs related to calves do occur in earlier and contemporaneous literature, it is extremely unlikely that they could have served as a source for Albert. Some of them resemble the calf story only tangentially, while others, which most closely resemble it, come from a tradition which Albert was most probably not acquainted with (as in the case of the Talmudic parallels).

In these circumstances, it may be only speculated as to which kind of source could have been the basis for Albert's citation. It might have been some pseudo-Avicennian writing which has not come down to us; or a marginal comment or gloss incorporated or perceived to be incorporated into some text of Avicenna. The cause might also have been a misreading of a manuscript text, a misinterpretation or a *lapsus memoriae*. Finally, a deliberate invention and attribution to Avicenna in order to lend it authority cannot be completely excluded.

A significant carelessness in citing the sources is to be seen in Albert's interpretation of Averroes discussed above, but there is at least an earlier source that can be pointed to, which demonstrates the same line of arguments. In case of the calf story, there is no such source, and the situation much more resembles the one with Albert's citations from Theophrastus. Some of them correspond to the text by Theophrastus, some are problematic, and for some « the sources of Albert's information remain, at present, a mystery ». [126] It is most interesting, however, that these enigmatic references are likewise related to the issue of generation and attribute the view that constellations can cause monstrous births to the 'Peripatetics' Porphypy and Theophrastus. Although a direct comparison is hampered by the fact that Albert does not introduce this example in the context of spontaneous generation, the similarity should not go unnoticed. It is remarkable that the references and attributions given by Albert in relation to this topic are untraceable or at present undetectable. It would be perhaps not too far-fetched to suppose that he had obvious difficulties with citing authorities on this issue. However, in order to correctly evaluate these particular inaccuracies, a general study of Albert's attitude to citations would be required.

[126] Robert W. Sharples, « Some Medieval and Renaissance Citations of Theophrastus », *Journal of the Warburg and Courtauld Institutes*, 47 (1984), p. 186–190.

The problem of citation identification in medieval scholarship is persistent. Amos Bertolacci has recently drawn attention to implicit citations from Avicenna in Latin philosophy and called for a « substantial revision of the indices and the apparati fontium of the existing editions ».[127] However, the present study demonstrates that explicit citations may be no less challenging, and a comprehensive re-assessment of explicit citations will certainly bring to light many puzzling perplexities and unexpected discoveries.

[127] BERTOLACCI, « The reception of Avicenna », p. 254.

Fig. 1: München, Universitätsbibliothek, Cim. 49, fol. 7v.

Fig. 2: London, National Gallery, Follower of Filippino Lippi, *The Worship of the Egyptian Bull God Apis*, c. 1500.

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