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Dominique DEMANGE (Université Paris-Nanterre, France)

“Roger Bacon’ Scientific and Metaphysical Realism (1)

The discussions about realism in the Franciscan circle of the 1260s in Paris: theological and epistemological issues ”

- 1 – General présentation**
- 2 – Historical context**
- 3 – The question of realism in Bonaventure’s *Conferences on the six days of the creation***
- 4 – Bonaventure and Roger Bacon on active matter and seminal reasons**

Sources

Roger Bacon

Txt1 = *Communia naturalium*, I, *pars secunda* (Opera Hactenus Inedita 2, 1909, pp.77-107).

Cap.4 : de privatione and potentiis materiae et de rationalibus seminalibus

Cap. 5 : de figurali dispositione materiae et compositi

Cap. 6 : quomodo praedicta possunt clarius videri per dictam divisionem

Cap. 7 : de prioritare universalis ad particulare secundum naturam

Cap. 8 : de exposicione auctoritatum in contrarium

Cap. 9 : de causa individuacionis

Cap.10 : de causis universalitatis

Bonaventure

Txt2 = *Sent.* II, dist.18, art.1, qu.3 (Opera Omnia, Quaracchi, II, 439-443) : « Utrum ratio seminalis sit forma universalis vel singularis ».

Txt3a = *Collationes in Hexaëmeron*, Opera Omnia, Quaracchi, V, *collatio IV (De visione prima)*, pp.348-353

Txt3b = *S. Bonaventurae Collationes in Hexaëmeron et Bonaventuriana Quaedam Selecta*, Firenze - Quaracchi – Ex typographia Collegii S. Bonaventurae, 1934, (*De visione prima, collation 1, §1*), pp.51-55

John Peckham

Txt4 = Ferdinand Delorme, “La *Summa de Esse et Essentia* de Jean Peckham, Archevêque de Cantorbéry.” *Studi Francescani* 14 (1928), pp. 56-71.

Peter of John Olivi

Txt5 = *Petrus Ioannis Olivi, Quodlibeta quinque.* ed. S. Defraia, Grottaferrata, Ed. Collegii S. Bonaventurae, 2002. *Quodl.* III, qu.4 (“An individua eiusdem specie different secundum substantiam aut solo accidente”), pp.176-180

Txt6 = *Petrus Ioannis Olivi, Quaestiones in secundum librum Sententiarum*, éd. Bernardus Jansen, Quaracchi, 1922-1926 – qu.II.31 (« an omnia quae educuntur de potentia materiae sint ibi prius secundum suas essentias seu secundum rationes seminales vel secundum potentias activas. »), vol.1, pp.508-570.

Txt7 = *Petrus Ioannis Olivi, Quaestiones in secundum librum Sententiarum*, éd. Bernardus Jansen, Quaracchi, 1922-1926 – qu.II.12 («An individuatio aliquid addat ad essentiam individui specificè acceptam »), vol.1, pp.210-231.

Txt8 = *Petrus Ioannis Olivi, Quaestiones in secundum librum Sententiarum*, éd. Bernardus Jansen, Quaracchi, 1922-26 – qu.II.13 (« an universalis sint in individuis suis secundum suam universalitatem and tantum in intellectu »), vol.1, pp.231-255.

Studies related to Bacon's theory of universals
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- Charles1861** = Roger Bacon. *Sa vie, ses ouvrages, ses doctrines. D'après des manuscrits inédits.* Par Emile Charles, Docteur ès-lettres, professeur de logique au lycée de Bordeaux. Paris, Libraire de L. Hachette et C^{ie}, Rue Pierre-Sarrazin, n°14 (près de l'Ecole de Médecine), 1861, pp.165-209, 368-391.
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Handout

(Hdt1) "Bacon's treatment of the problem of individuation seems to justify Professor Little's estimate of Bacon's meagre philosophical abilities and also the opinion of M. Charles that Bacon tends to suppress problems that seem to him useless or insoluble." (Sharp1930, p.148)

(Hdt2) "The most precise elements with which Olivi himself remembers his years of study in Paris are linked to Bonaventure, minister general of the order. Bonaventure lived in or near the order's convent in Paris in the years 1266-70. Olivi reports hearing the *Conferences on the Holy Spirit* of Bonaventure in the spring of 1268. <...> Apart from Bonaventure, the main Franciscan master mentioned by Olivi is John Peckham, whose *Tractatus pauperis* he frequently quotes, while his commentary on the first book of the *Sentences* is cited from memory. <...> A number of references to a *corrector sollemnis* in the Bible are undoubtedly aimed more at William de la Mare. As we shall see, Olivi knew his *Correctorium fratris Thomae* very early on, but he never refers to him as his teacher. By studying Roger Marston's sources, Ignatius Brady has been able to establish that the latter strongly criticised a thesis of Eustachius of Arras, which Olivi also criticised in similar terms in his question on the Trinity <...> Although the Friars Minor had only one chair at the University of Paris, several masters were active at the same time within the convent, and students also followed the lessons of the bachelors. Among the latter were Bartholomew of Bologna and Matthieu of Aquasparta. Finally, it is certain that Roger Bacon was present at the convent during these years, and that Olivi was familiar with some of his works. He challenged some of them head-on (*De multiplicatione specierum*) and drew inspiration from others (*De signis*). His knowledge of Bacon's work was probably not purely bookish, but it is unlikely that Bacon was in charge of any teaching at the time."

Sylvain Piron, *Parcours d'un intellectuel franciscain. D'une théologie vers une pensée sociale : l'œuvre de Pierre de Jean Olivi (ca. 1248 – 1298) et son traité De contractibus*, Doctoral dissertation (1999), Paris, Ecole des Hautes Etudes en Sciences Sociales. Première partie (« La constitution de l'œuvre »), chap.I (Aperçu biographique), A (« Les années de formation »), p.23-24. English translation is mine.

(Hdt3) "And I believe that in this I have been able to satisfy your few questions - not as much as I wish, **but as much as I have been able to gather knowledge by listening, researching and exchanging with men of the greatest acuity** <of mind>. <On these subjects,> believe nothing that is contrary to what representation (*phantasia*) has taught you, in the literal sense, or to what it has informed or disproved - being thus perfectly instructed. And yet I, in asserting this, am only anticipating – it is in the meantime that I rely on the gifts of your youth to <perceive> **what by scrupulous study, youthful wit and scholastic exercise I <myself once> learned at the magisterial gymnasium.** (John Peckham, *Summa de esse et essentia* (Txt4), p.71¹)

(Hdt4) "There are at present six ways of dividing according to hidden differences in the quiddities: that is, into substance and accident, universal and particular, potency and act, one and many, simple and composite, cause and caused. These are six lights that prepare the soul for knowledge and valid perception". (Bonaventure *Collationes in Hexaemeron*, Txt3a p.350a² ; Txt3b p.60 is identical with Txt3a)

¹ « Et in hoc credo tuis quaestionunculis satisfacere, non quantum cupio, **sed quantum artem colligere potui audiendo, investigando, cum acutissimis hominibus conferendo.** Nulli credas de contrario, quod propria docuit phantasia vel quod informavit vel infirmavit, sic edoctus. Et hoc tamen ego asserendo praesumo, sed facultati infantiae tuae interim committo, **quod diligenti studio, iuvenili ingenio, scholastico exercitio didici in gymnasio magistrali.** Deo gratias.» (Txt4, p.71)

² « Secundum quidditatum differentias occultas fit divisio sex modis ad praesens: in substantiam et accidens, in universal et particulare, in potentiam et actum, in unum et multa, in simplex et compositum, in causam et in causatum. Haec sunt sex lumina, quae disponunt animam ad sciendum et bene sentiendum. » (Txt3a, p.350a)

(Hdt5) "The third division is into **potency and act**, and here there are many errors. For some philosophers say that act adds nothing to potency except a manner of being, that it stands in the same relationship to it as complete stands to incomplete. We are not speaking here of purely passive potency, but of that which proceeds to act. For since **in every creature there is both active and passive potency**, these two potencies must be founded on different principles of the thing (*principia rei*). Now this is the power of that potency which is **the seminal reason** < Txt3b : If we speak of potentiality, which is an incomplete act, as is the seminal reason, which according to the natural philosopher is called active potentiality and is something of the form. > : sometimes it adds a part of being or essence, as for instance over and above the principle body it adds living in relation to a given object, but in such a way that, while the attribute living is something in itself, it is ordained to sensitivity. And so, over and above living, the seminal reason or <active> potency adds sensible, and so forth until the level of man is attained. It is the same with the potencies of the soul: for as the quadrangle has one more angle than the triangle, and the pentagon one more than the quadrangle, so sensitive is added to vegetative and rational to sensitive. <...> Hence it is unsound to propose that the final form is added to prime matter without something that is a disposition or potency towards it, or without any other intermediate form. (Bonaventure *Collationes in Hexaemeron*, Txt3a = pp.350b-351a³ ; Txt3b = pp.53-54⁴)

(Hdt6) The second division is into **universal and particular**; and here again there is a major error. For some philosophers say that the universal is nothing, except in the soul <and Anselmus ridicules them, for this is not true. It is necessary that the nature of the universal exists in the thing, in the soul, and in the eternal art. Some say that the nature of the universal exists only in the eternal art, like Plato, and others say it exists only in the thing, and both are wrong.> I say that there is a universal oneness related to multiplicity (*unum ad multa*), another existing in multiplicity (*unum in multis*), and yet another exceeding multiplicity (*unum praeter multa*). The universal oneness *related* to multiplicity (*unum ad multa*) is found in the potency of matter, which is not fulfilled; the universal oneness *existing* in multiplicity (*unum in multis*) is the common nature found in particular individuals; and the universal oneness that *exceeds* multiplicity (*unum praeter multa*) exists in the

³ « Tertia divisio est potentiae et actus; et hic sunt multi errores; Dicunt quidam, quod actus nihil addit super potentiam nisi modum essendi secundum completum et incompletum. Non loquimur hic de potentia pure passiva, sed de illa quae procedit ad actum. Necesse est enim, cum in omni creatura potential activa sit coniuncta potentiae passivae, quod illae duae potentiae fundentur super diversa principia rei. De potentia, quae est ratio seminalis, haec est vis: quia potentia talis super actum aliquando addit partem essendi, vel essentiae, ut, super rationem corporis addit animatum secundum rem, pro eo quod animatio aliquid est, ordinatum tamen ad sensibile; et super animatum addit sensibile, et sic usque ad hominem. Sic similiter de potentiis animae, quod sicut tetragonus addit unum angulum ad trigonum, et pentagonus ad tetragonum; sic sensitivum ad vegetativum, et rationale ad sensitivum. Aliquando autem addit solum modum essendi, ut, si de uno in potentia fiat unum in actu, addit solum modum essendi, quia unum non coniungitur materiae simpliciter, sed materiae habenti vitam in potentia radicali. Unde insanum est dicere, quod ultima forma additur materiae primae sine aliquo, quod sit dispositio vel in potentia ad illam, vel nulla forma interiecta.” (Txt3a, p.350b-351a)

⁴ « Tertia divisio est quod ens quoddam est potentia, quoddam actu. Hic sunt errores infiniti, quid addat actus supra potentiam. Secundum autem aliquos, solum addit modum essendi secundum esse completum et incompletum. Nos vero distinguimus de potentia, quae procedit in actum ; in omni enim re habente potentiam activam et passivam est differentia actionis et passionis, nec super id radicanter in re creata secundum fidem nostram. Si loquamur de potentia quae est actus incompletus, ut est ratio seminalis, quae secundum naturalem philosophum dicitur potentia activa et est aliquid formae, hic actus super potentiam alicubi addit modum essendi, alicubi partem essentiae, non alterius, sed ordinabilis cum illo. Quod patet, quia animatum addit vere super corpus, sensibile super animatum, rationale super sensibile. Si ergo loquamur de hac additione, hic est additio realis, quia anima est aliquid ultra naturam corporis, licet essentialiter ad illud ordinatum ; similiter de sensibilitate et rationabilitate, ut tetragonus super trigonum addit novum angulum et pentagonum super tetragonum addit non solum modum essendi, ut patet II *De anima*, in principio. Si autem loquamur de potentia quae solum est passiva, ut quod modo est in potentia, modo in actu, addit modum essendi solum. Hic nota quod hoc non est verum quod ultima forma addatur primae materiae nulla forma interiecta, quia sensibile et vegetabile interponuntur et illa etiam additio est realis et naturalis ; nec tamen de vivo potentia fit actu vivum ; radicale vivum erat ibi.” (Txt3b, p.53-54)

soul. And so, the one related to the many, the one in the many, and the one exceeding the many exist in Eternal Art; and by means of this Art and for this reason oneness exists in reality. For it is clear that two men are similar, but not a man and a donkey; hence it is necessary that this likeness be founded and stabilized in some stable form: and not in some form existing in another individual, since it is particular; hence **it must exist in something universal (*in aliqua universalis*)**. Now the universal principle is not contained exclusively within the soul, but exists in the thing (*in re*) according to the process of passing from genus into species, so that we communicate first with the substance as with the most general principle, then with the other principles, until we come in contact with the final form of a man. <But as it is in relation to many, in many, and beyond many, it is the nature in the eternal art, and this in the most complete way. For the nature of the universal is not complete in the soul, **which follows the process from genus to species, as you and I in substance, in corporeality, in animality, in humanity, according to what is the categorical coordination.**>. (Bonaventure *Collationes in Hexaemeron*, Txt3a = p.350⁵ ; Txt3b = pp.52-53⁶)

(Hdt7) "What holds in the case of the soul is very close to what holds concerning figures: for in the case of both figures and ensouled things, what is prior is always present potentially in what follows in a series—for example, the triangle in the square, and the nutritive faculty in the perceptual faculty. One must investigate the reason why they are thus in a series. For the perceptual faculty is not without the nutritive, though the nutritive faculty is separated from the perceptual in plants. Again, without touch, none of the other senses are present, though touch is present without the others; for many animals have neither sight nor hearing nor a sense of smell. Also, among things capable of perceiving, some have motion in respect of place, while others do not. Lastly, and most rarely, some have reasoning and understanding. For among perishable things, to those to which reasoning belongs all the remaining capacities also belong, though it is not the case that reasoning belongs to each of those with each of the others." (Aristotle, *De anima*, II, 414b29-415a12)

(Hdt8) "For one could not regard the foetus as soulless, as in everyway lacking in life. For both the seeds and the embryos of animals are no less alive than plants, and are fertile up to a certain point. That they have nutritive soul, then, is evident (and why they must acquire this first is evident from the determinations about the soul made elsewhere), but as they proceed they also have perceptual soul in virtue of which they are animals. For they do not at the same time become animal and human, or animal and horse, and likewise in the case of the other animals. For the last thing to come to be is the end, and the end of the coming to be of each thing is what is special to it." (Aristote, *Generation of animals*, II, chap.3, 736a33-b4)

⁵ « Secunda divisio est in universale et particulare; et circa hoc est magnus error. Aliqui dicunt, quod universale nihil est nisi in anima; Plato posuit, quod esset solum in Deo; alii quod solum in anima. Isti nimis abstrahunt. Dico ergo, quod est universale unum ad multa, unum in multis, unum praeter multa. Unum ad multa est in potentia materiae, quod non est completum; unum in multis, ut natura communis in suis particularibus; et unum praeter multa in anima. Unum autem ad multa et unum in multis et unum praeter multa in arte aeterna sunt; per illam enim artem et rationem consistit in re. Planum est enim, quod duo homines assimilantur, et non homo et asinus: ergo necesse est, ut illa similitudo fundetur et stabiliatur in aliqua forma stabili, non quae est in altero, quia illa est particularis: ergo in aliqua universalis. Ratio autem universalis non est tota in anima, sed in re secundum processum generis ad speciem, ut, communicamus primo in substantia ut in generalissimo, deinde in aliis usque ad formam hominis ultimatam." (Txt3a, §9, p.350)

⁶ « Secunda divisio est ens aliud universale, aliud particulare. Hic similiter sunt radices circa rerum cognitiones. Quidam enim dixerunt quod universale nihil sit nisi [in] anima, quos Anselmus deridet. Hoc enim non est verum. Necesse est enim quod ratio universalis sit in re, [in] anima, in arte aeterna. Dicunt enim quidam rationem universalis solum esse in arte aeterna, ut Plato, quidam in re tantum, et utrique male. Unde nota quod forma, qua unus homo cum alio convenit, est convenientia realis stabilita in forma universalis; nam universale est unum in multis, unum praeter multa, unum ad multa. Secundum quod est potentia in materia, sed non completa, est unum ad multa; secundum autem quod est in particularibus, est unum in multis; secundum quod est in anima, est unum praeter multa. Secundum autem quod est ad multa, in multis, praeter multa, est ratio in arte aeterna et completissime. Ratio enim universalis non est completa in anima, quae est secundum processum generis ad speciem, ut ego et tu in substantia, in corporeitate, in animalitate, in humanitate, secundum quod est coordinatio praedicamentalis. » (Txt3b, §9, p.52-53)

(Hdt9) "Some have indeed wanted to say that, since universals are not fictions, they exist not only in the soul but also in reality and truth, and in nature. And because everything that exists in nature is based in matter, both universal forms and singular forms must have their existence in matter. Thus, the universal form and the singular form do not differ by abstraction from matter and concretion in matter, but they differ by the addition of one to the other and by being more or less complete. A sign of this is that, in the coordination of genera and species, the form of the species is the most complete and complex. The form of the genus, in relation to that, is something in potential, and it becomes more actualized through the addition of a difference to it. And thus, since a seminal reason signifies a form in an incomplete sense, they said that the seminal reason is nothing other than the universal form."⁷ (Bonaventure, *Sent.*, Txt2 = 440b)

(Hdt10) "We must therefore admit another kind of universality, which is no longer that which the metaphysician or logician considers, but that which the physicist observes when he studies the development of beings and especially that of organised beings. There is in fact a kind of universality that is not essential, but, if I may put it this way, radical; it is that which belongs, not to the definite essences that can be asserted of particulars, but to those beings that are still undetermined, whose essence is like the germ, from which several others take their roots and which are still undifferentiated in relation to what may arise from them. It is no longer a question of abstract universality, but of the multiple virtualities of a real and concrete being, albeit incompletely developed. And it is precisely through the physical enrichment of its content, not through the abstract determination of its notion, that seminal reason will develop." (Etienne Gilson, *La philosophie de saint Bonaventure*, Vrin, 1943, p.245-46).

(Hdt11) "Prime matter has absolutely no form, neither universal nor particular, but it first receives a universal form and, through that, it receives all other forms up to the individual ones."⁸ (Averroès)

(Hdt12) "It appears, then, that certain forms arise from nature while others result from action <i.e. action of real individual substances, such as technique and art>. Indeed, reason arises from nature, while heat and passion consist in action. In some cases, however, one may find difficulty in determining whether a given form comes from nature or from action <...> However, anything that involves a combination arises from action, as is the case with a house. This is all clear with respect to such things.

But it is not obvious when it comes **to realities that are found in several things** <i.e. universal realities>. For those things **which exist in several instances** cannot arise from action, yet at the same time they do not seem to be produced by nature, since realities that arise from nature take their beginning from an existing creature. It is therefore clear that these are not creatures (**for there is absolutely no reason that can explain why such creatures <i.e. universals> should exist**). **Thus, nature operates secretly in these things.**

For just as the union of several parts derives from a certain structure which exceeds the sum of its constituent elements, so too does **a certain unity become intelligible from the multiplicity of singulars**, which surpasses their individual predications. **Hence, all natural commonality exists because it proceeds from singularity, which is equal to creation.** And if we inquire carefully: **just as we find that nature operates in a hidden way**

⁷ « Quidam enim dicere voluerunt, quod cum universalialia non sint fictiones, realiter et secundum veritatem non solum sunt in anima, sed etiam in natura; et quia omne quod est in natura, habet fundari in materia, tam formae universales quam singulares in materia habent esse. Et ita non differunt forma universalis et singularis per abstractionem a materia, et concretionem in materia, sed differunt per additionem unius ad alteram et per magis completum et minus completum. Cuius signum est, quia in coordinatione generum et specierum forma speciei est completissima et compositissima. Forma vero generis respectu illius est ens in potentia, et fit magis in actu per differentiam sibi superadditam. Et ita, cum ratio seminalis dicat formam ratione incompleta, dixerunt, nihil aliud esse rationem seminalem quam formam universalem. » Bonaventure, Txt2, p.440b

⁸ Averroès, *In Met.* I, tc.17, ed. Juntas fol. 14vK – *Auctoritates aristotelis*, ed. Hamesse n°32 p.117 : « Materia prima nullam formam habet omnino, nec universalem, nec particularem, sed recipit primo formam universalem et mediante illa, recipit omnes alias formas usque ad individuales. »

within actions, so too do we find that the creator of creatures is found in nature through action; for indeed, he has established nature by means of number."⁹

(Hdt13) "Having seen these things, it is easy to assign seminal reasons in matter, which theologians speak of, because the seminal reason and potentiality are entirely the same. Hence, the seminal reason is the very essence of incomplete matter, which can be advanced toward completion, just as a seed into a tree. But when considered in itself, it is like a seed, and when it is to be promoted and desires to be promoted, it is called a seminal reason. For that seminal reason is nothing but the essence insofar as it strives and desires, and therefore, just as there is a threefold potentiality, so there is a threefold seminal reason, namely, the composite essence with respect to the composite, its incomplete form with respect to the specific form, and its matter with respect to the specific matter. And since there are two lines of generable and corruptible things—one of universals, the other of singulars—it is clear that these active potentials and seminal reasons are neither simply universal nor singular, but with respect to universal things, they are universal, and with respect to singular things, they are singular. **For the principles of universal things are universal, and those of singular things are singular.** And thus, it is clear what must be held in theological questions about the seminal reason. It is neither purely universal, as some believe, nor purely singular, but **with respect to the singular things to be generated, it is singular, and with respect to universal things, it is universal.** And just as was said about prime matter, so it must be understood concerning other secondary matters, up to the final limits of generation." ¹⁰ (Roger Bacon, Txt1, pp.84-85)

⁹ « Videtur autem forma quedam a natura esse, quedam vero in actu; ratio etenim a natura est, calor vero et passio quedam in actu consistunt. In quibusdam autem dubitatio est utrum a natura an ab actu incipiant, ut in figura incisionis (nam nihil additionis fit, sed separatio quedam partium); dico autem figuram esse a natura, sentiri vero ab actu; sed que coniunctionis est, actus est, ut domus. Manifestum est autem de his. Sed in his que in pluribus sunt palam non est; nam ea que in pluribus sunt, in actione esse impossibile est, a natura vero non videtur fieri, quoniam ea que a natura sunt, a creatura existente principium sumunt; palam vero est creaturas non esse (nihil enim rationis omnino quare huiusmodi creature sint poterit explicari). Natura igitur occulte in his operatur; nam, sicut ex plurium coniunctione constitutio quedam priorum excedens quantitatem efficitur, sic ex singularium discretionem unum quiddam intelligitur eorum excedens predicationem. Quapropter communitas omnis naturalis est quoniam a singularitate procedit, que creationi coequatur. Subtiliter autem speculantes, sicut naturam in actionibus latenter operari invenimus, sic creaturarum creatorem in natura ex actu; numero etenim naturam stabilivit. Sed hec hactenus; alterius enim considerationis sunt. » Gilbert de la Porrée, *Liber sex principiorum*, ed. L. Minio-Palluelo, *Aristoteles Latinus* 6-7 (« *Categoriarum Supplementa* »), Bruges-Paris, Desclée de Brouwer 1966, p.36 line 14 to page 37 line 10.

¹⁰ "Hiis visis, facile est assignare rationes seminales in materia de quibus loquuntur theologi, quia ratio seminalis et potencia idem est penitus, unde ratio seminalis est ipsa essentia materiae incompleta quae potest promoveri in complementum, sicut semen in arborem. Sed ut in se consideratur, est ad modum seminis, ut vero promovenda et appetens promoveri est ratio seminalis. Illa enim ratio seminalis non est nisi essentia in quantum conatur et appetit, et ideo sicut est hic triplex potencia, sic triplex ratio seminalis, scilicet, essentia composita respectu compositi, et forma ejus incompleta respectu forme specificae, et materia ejus respectu materie specificae. Et cum duplex est linea generabilium et corruptibilium, una est universalium alia est singularium, manifestum est quod potentiae istae activae et rationes seminales neque simpliciter sunt universales nec singulares, sed respectu rerum universalium sunt universales, respectu rerum singularium sunt singulares. Principia enim rerum universalium sunt universalis et singularium singularia. Et sic patet quid tenendum est in questionibus theologiae de ratione seminali, nec est solum universalis, ut aliqui estimant, nec solum singularis, set respectu rerum singularium generandarum est singularis, respectu universalium est universalis. Et sicut dictum est de materia omnino prima, sic intelligendum est de aliis secundariis, usque ad ultimos terminos generationis, semper enim subicitur aliquod genus respectu duarum specierum et aliquod individuum generis respectu duorum individuum illarum duarum specierum. » Roger Bacon, *Communia naturalium*, I, part2, chap.4 (= Txt1, pp.84-85)