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CONTROVERSIES ON NATURE AS UNIVERSAL LEGALITY (1680-1710)

(SOPHIE ROUX)

Introduction¹

Two distinct interests can justify a study of the emergence and the development of the notion of Nature's law. This notion is omnipresent in moral and political texts in the 18th century, so its origin can perhaps be sought by supposing, as is suggested by these texts, that this notion was in fact developed in the field of physical science from which it was later exported². It is clear that this direction is rich in illusions if we do not maintain sufficient distance from the object studied, which in this case is particularly ideological. Ill-controlled retrospection has also paved the way of the second direction, that taken by historians working on the origins of modern science. Two types of preconceived assumption have defined their studies: first, a historical assumption which holds that the 18th century experienced a scientific revolution that gave science its modern form³; second, a philosophical assumption which holds that law is the epistemological entity at the heart physics⁴. These two types of prejudice come together in the thesis that the invention of a new concept of law, or even a new idea of Nature as universal legality, constituted the foundation of the new science⁵. This thesis was particularly represented by Ernst Cassirer, who noted in Leonardo da Vinci, Johannes Kepler and especially in Galileo Galilei, an idea of Nature as an imminent whole, totally determined by laws whose universality and necessity were the prerequisites of understanding⁶.

Although the neo-Kantian idea of Nature as universal legality is always more or less lurking in the background of studies on the history of science, these studies rarely come to the same conclusions. It has been held that the emergence of the notion of Nature's law in the modern period was linked to the replacement of local feudality by a monarchy unified in the person of the Sovereign⁷; that voluntarism formed the intellectual context that had allowed the appearance

¹ I thank Mark Naimark, who translated this essay. The first paragraphs of the introduction summarize Roux 2001.

² Casini 1976. Dufour 1980. Regarding these exportation phenomena, see Larrère in this volume.

³ Oakley 1961a: 433 and Oakley 1961b: 78-79 oppose Nature of the Greeks and Nature of the Renaissance. Milton 1981: 183 deems that the emergence of the notion of law cannot be separated from the abandon of substantial forms.

⁴ Zilsel 1942a: 245. Milton 1981: 173. Ruby 1986: 341. This assumption goes back to the 19th century: the reign of law is apparent there in both science and philosophy (as in, for example, John Stuart Mill and Auguste Comte).

⁵ Needham 1951: 518, 542. Chevalley 1995: 128-129. Milton 1998: 680.

⁶ Cassirer 1906: 248, 285-287, 307-309. This thesis takes as given the Kantian definition of Nature (for example *KRV*, A 216/B 263, AK III: 184). Chevalley 1995: 169-187 analyses the concepts of Nature and law in Kant.

⁷ Zilsel 1942a: 277-278.

of an empirical concept of law⁸; that the word "law" appeared prior to the 17th century in scientific contexts with no reference to a divine legislator⁹; that there was no single concept of law in the works of Galileo Galilei, René Descartes, Francis Bacon, Robert Boyle, Baruch Spinoza, Christiaan Huygens, Godfried Wilhelm Leibniz or Isaac Newton, but rather mutually exclusive concepts¹⁰; and finally, that quantum mechanics invalidated the concept of Nature's law that characterized classical physics¹¹.

The divergences among these conclusions arise in large part from the fact that these studies dealt in fact with distinct propositions. In particular, the following four propositions must be distinguished:

(1) Seventeenth-century scientists discovered certain regularities in phenomena, for example what we now know as the "law of falling bodies", "Boyle's Law", or the "law of universal attraction".

(2) The word "law" becomes increasingly frequent in scientific texts of the modern period¹².

(3) One or more concepts of law emerged in the sciences of the 17th century¹³.

(4) Classical science introduced the idea of Nature as universal legality¹⁴.

Because terminological variations are clues to conceptual variations, the raw material of historians of ideas consists of the words they find in texts: it is therefore reasonable to begin with the second of these four propositions. This is why in a recent article I studied the appearance of the metaphor of law in the sciences, or more precisely, the generalization of the classical meaning of the word "law" in the common language of science¹⁵. From the outset, I characterized the *classical* meaning of the word "law" by the encounter of the two following usages: (a) A law reveals a natural regularity; this regularity concerns an abstract phenomenon and is expressed in the form of a relation between quantities (*physico-mathematical* usage); (b) The laws of Nature, which apply without exception to all natural bodies, are the laws by which the divine legislator creates and orders Nature (*metaphysical* usage).

In the first part of the article in question, this characterisation allowed me to understand how the classical meaning of the word "law" had been formed. In contexts concerning the sciences or the description of Nature, at least three usages of the term "law" had existed before the 17th century, each associated with a semantic field (*specific* usage; *disciplinary* usage; *mathematical* usage). All three contributed to the formation (and to the ambiguities) of the physico-

⁸ Oakley 1961a: 433. Oakley 1961b: 82. Oakley 1984: 77-78. Milton 1981.

⁹ Ruby 1986: 341-343.

¹⁰ Casini 1976: 418 and 428. Steinle 1995: 318-319 and 357-363. Milton 1998: 692-699.

¹¹ Chevalley 1995:187-223.

¹² Zilsel 1942a. Ruby 1986.

¹³ Oakley 1961. Oakley 1961b. Steinle 1995. Milton 1998.

¹⁴ Chevalley 1995.

¹⁵ Roux 2001.

mathematical usage of the word "law": a law concerns an abstract phenomenon and describes specific beings; it is the foundation of a discipline and orders the things of Nature; it expresses a regularity and has a mathematical form. As to the metaphysical usage, it certainly existed before the 17th century, in particular in morals, but the occurrences of "Nature's law" in a strictly physical context were exceptional, with the inalterable order of a Nature created by God more often described by other metaphors: "order" itself, "decrees", "disposition", "constitution" and "system".

In the second part of this article, this semantic approach was complemented by a quantitative analysis. Before 1660, the word "law" is rare in contexts relating to science or to the description of Nature, and the few authors who use it, do so in the singular. Its use spread in the period 1660-1680 when it coexisted with other terms that it did not replace rightaway, such as "rule", "principle", "hypothesis" or "theorem"; the members of the Royal Society in particular use it in the singular. Finally, dictionaries and on-line data bases show that the term enters general use at the end of the 17th century in texts where the physico-mathematical and the metaphysical usages are found together. These are the texts I propose to study in the present article, concentrating on continental Europe¹⁶.

To present them briefly, we can divide them into two constellations. The first relates to the polemic between Antoine Arnauld and Nicolas Malebranche which aroused from the publication of the *Traité de la nature et de la grâce* (1680). The debate was opened by Arnauld on the question of the nature of ideas. One its goals as of 1685 was to determine how God rules over the kingdom of Nature and on the kingdom of Grace: for Malebranche, God acts through general laws, for Arnauld, God acts by particular wills. In 1686, Bernard Le Bovier de Fontenelle and Pierre Bayle intervened in this debate, Fontenelle opposing Malebranche's occasionalism and Bayle supporting it¹⁷. Jacques-Bénigne Bossuet took position against Malebranche and encouraged François de Salignac de la Motte-Fénelon to do the same. Yet other protagonists intervened (Pierre-Sylvain Régis, Henri Lelevel and Dom François Lamy) and the polemic would end only with the death of Malebranche (1715)¹⁸.

¹⁶ On the English debates, see Westfall 1958 and Steinle in this volume. The similarity of the controversies in Britain and on the Continent should demonstrate that the problem was not one of rivalry among Protestant denominations in Britain, and among Catholic orders on the Continent, but rather in the assimilation of the idea of universal legality.

¹⁷ In fact, Bayle was involved in the polemic via his reviews as of 1684; see in particular Bayle 1684-1687, Apr. 1684, art. 2: 25-26; May 1684, art. 4: 49-50; Sept. 1684, art. 2: 119-121; March 1685, art. 4: 242; May 1685, art. 3: 282-284; Jul. 1685, art. 8: 333-335; Aug. 1685, art. 3: 346-349; Dec. 1685, art. 1: 426-427; March 1686, art. 3: 507-508; Apr. 1686, art. 3: 531-533. As to the nuances of Bayle's "Malebranchism" in this period, see Mori 1999:109-118.

¹⁸ On this first constellation, see Bouillier 1868, vol. II: 178-207, 236-243, 267-276. Toccane 1978: 97-106. Moreau 1999.

The second constellation is organized around Leibniz and Bayle. In his *Dictionnaire historique et critique* (1696), Bayle took position on a Malebranchist basis both against the Leibnizian system of pre-established harmony, publicised in Leibniz's *Système nouveau de la nature et de la communication des substances* (1695), and against the plastic natures and vital principles defended by Jean Le Clerc, the translator of Ralph Cudworth and Nehemiah Grew. The exchanges between Bayle and his two opponents lasted until 1702 and 1707 respectively¹⁹. With *De Ipsa natura* (1698), Leibniz had in the meantime taken position in a controversy that Boyle's *Free Inquiry into the Vulgarly received Notion of Nature* (1686) had ignited between two German professors, Johannes Christoph Sturm (a partisan of Bayle) and Gunther Christoph Schelhammer (a defender of Aristotle): he attacked once again the occasionalist thesis that God is active everywhere, and that creatures are not true causes²⁰.

This presentation would be incomplete if I did not mention the work of Benedictus de Spinoza. His *Tractatus theologico-politicus*, published in 1670 and censored in Holland, was known in a French translation (1678) which was clandestinely distributed under a variety of titles; the *Opera posthuma*, including the *Ethica*, were published in 1677. However uncertain and partial, the contemporary reception of Spinoza's work was both a reference and a foil, the proof of the excesses to which the Cartesian premises can lead²¹.

The turn of the 18th century was long considered as the moment of a "crise de la conscience européenne", the womb of Enlightenment thinking²². I will take as given the work in the history of ideas relating to this turning point, the better to concentrate on the notion of Nature's law. Such a focus is obvious, for this particular notion is omnipresent, insofar as it allows questioning of the relations between three terms — the things of our world, a Nature defined in terms of universal legality, and God, creator, legislator and guarantor of a particular providence. This presents, however, certain difficulties, the first of which comes from the density of the polemic field. It is difficult to isolate the notion of Nature's law in systems in which everything is connected, and in controversies which constantly shift from one problem to another: any position is subject to so many objections that one comes to feel that none of them is tenable. The second difficulty is in putting these polemics in their context, in avoiding two temptations: first, to project the various positions on a temporal axis that would lead to the identification of the

¹⁹ On this second constellation, see Roger 1993: 418-426. Toccane 1978: 106-114. Nadler 1993. Mori 1999: 89-154.

²⁰ In the highly favourable report he gave of Boyle's theses on Nature, Bayle highlights their proximity with those of Malebranche (Bayle 1684-1687, Dec. 1686, art. 3: 705-708). On the genesis of *Free inquiry*, see Davis and Hunter 1996. On *De ipsa natura*, see Wilson 1987. Palaia 1990. Gaudemar 1995.

²¹ On this first reception, see Vernière 1954, vol. I.

²² Hazard 1961. Toccane 1978. Roger 1993.

scientific with progress and the religious with the retrograde; second, to see in these polemics only one form of the timeless question of the autonomy of Nature with respect to its Creator²³.

To mitigate these difficulties, the texts will be broken up into elementary kernels so as to isolate the terms of the problem and the possible alternatives²⁴. For each problem, I will begin by presenting the theses of Malebranche because they manifested the idea of universal legality, and thus structured the polemic. In so doing, I am perforce giving his adversaries the last word: this does not mean that they refuted Malebranche, for the controversies on the idea of legality are metaphysical, and thus one cannot in truth speak of resolution.

Three general questions will be addressed in turn, with the second and third each being broken down into two subquestions. The first question is that of the *modality* of the laws of Nature: are they necessary, arbitrary or contingent? The second question is that of the *universality* of the laws of Nature: is the Malebranchist principle of the simplicity of the ways 1) metaphysically satisfying and 2) reconcilable with the notion of particular providence? The third question is that of the *efficacy* of the laws of Nature: 1) what is the relation, *a parte Dei*, between law, will and power, and 2) are creatures able to respect the laws of Nature?

The modality of the laws of Nature: necessity, arbitrariness and contingency

The question of the modality of the laws of Nature does not depend solely on the introduction of the idea of universal legality; the two opposing traditions most often cited go back in fact to the Middle Ages. According to the voluntaristic tradition, the principal attribute of God is His will, it is by a free decree that He institutes revocable laws, known only by experience and not founded on the nature of things. According to the intellectualist tradition, the primary attribute of God is understanding, His ideas constitute an eternal order on which the nature of things depends and which our reason can know²⁵. We can of course classify our authors as belonging to one or the other of these traditions: Arnauld and Fénelon are more voluntaristic, while Malebranche and Leibniz are more intellectualist. The former observe that a God acting according to principles imposed by an eternal order would lose all freedom, and more importantly, all goodness: invincibly obeying an inviolable Order, or even occasional causes, He would be impotent²⁶. The latter reply that the choice of the better does not arise from necessity and that as Order is only the understanding of God, He is not giving in to an outside force, but rather setting laws for Himself²⁷. The principal references for them all are nonetheless not so

²³ Against the first temptation, see Moreau 1999: 258-262, 316-321, who does not escape all retrospective illusion, since he treats Arnauld or Bossuet as visionaries. Wilson 1987 gives in to the second temptation.

²⁴ This procedure has already been tested in Roux 1996.

²⁵ Oakley 1961a and 1961b. Oakley 1984. Courtenay 1990. Osler 1994.

²⁶ Arnauld 1985a, 2: 686-687. Arnauld 1685b, I 2, I 3, II 26 3, 8-10, II 25, II 27: 204, 212, 584, 593-595, 598-600, 603. Fénelon 1687, 2, 6, 8, 18: 326-328, 336-338, 341-345, 370-371. Bayle 1704a, 106, 114: 336a, 348a. Bayle 1704b 151, 165, 166: 811-812, 848, 850. Bayle 1707, 13, 16: 57-58, 62-63.

²⁷ Leibniz 1710, 191, 228-230. Malebranche 1680, I 21, II 51: 34, 110.

much William Ockham or Thomas Aquinas as the Cartesian doctrine of the free creation of eternal truths and Spinoza's necessitarianism.

According to Descartes, God freely created the so-called eternal truths just as He created other creatures: as a king who makes laws in his kingdom, he could make $2+2 = 5$ or choose not to enact the principle of non-contradiction. But this does not imply that these truths are not necessary: God has made them necessary, and has imprinted this necessity in our minds²⁸. In a word, they are necessary without being necessarily necessary²⁹. The theological question of the creation of truths and the metaphysical question of their status were thus dissociated: in particular the laws of Nature, while being arbitrarily created by God, nonetheless allow for knowledge whose certainty is at least equivalent to that characterising the understanding of mathematical truths³⁰.

Spinoza had denied the specificity of the contingent and reduced the possible to the necessary: things cannot be produced in another way or in another order than they have been; everything that can be, from necessity is³¹. As to what are commonly called the "laws of Nature", he affirmed in particular that they arise from the nature of things, and gave a *more geometrico* demonstration of the Cartesian laws of motion³². In the period 1680-1710, the problem becomes that of avoiding the Cartesian doctrine of eternal truths without falling into Spinoza's necessitarianism. For Malebranche and Leibniz for example, there exists an eternal order of ideas consubstantial with the understanding of God³³, but the laws of Nature do not arise from this order and are not necessary in a mathematical or logical way.

²⁸ To Mersenne, 15 Apr. 1630, 6 May 1630, 27 May 1630, in Descartes 1964-1974, I: *resp.*, 145-146, 149, 152.

²⁹ For the distinction between "necessary" and "necessarily necessary", see the letter to Mesland, 2 May 1644, in *ibid.*, IV: 118-119. More generally, see the letters to Gibieuf, 19 Jan. 1642; to Arnauld, 29 Jul. 1648; to Morus, 5 Feb. 1649; to Voetius in, *resp.*, *ibid.*, III: 476-478, V: 223-224, V: 272-273, VIII-2: 60. On the eternal truths, see, in the vast secondary literature, Frankfurt 1977. Beyssade 1979. Marion 1981. Curley 1984. The three laws of Nature set out by Descartes are surely among the eternal truths; they nonetheless present a specific problem: as they are founded on the nature of God, they cannot be described as arbitrary in the same way as, for example, $2+2 = 4$. For an analysis of this problem, see Roux 1999.

³⁰ An heir to this dissociation is Jean Le Rond d'Alembert, for whom, the theological question having lost all meaning, there remained only the metaphysical question (D'Alembert 1758, "Discours préliminaire": xxiv-xxvi). The question as to whether physical laws are necessary or contingent had been proposed by the Berlin Academy in 1756; for a few references, see Tonelli 1959.

³¹ Spinoza 1677, I 33 and scol., I 35 : 341-346.

³² Spinoza 1671, 4: 722-723. Spinoza 1663, II 13-II 31: 269-288. I describe here the way in which Spinoza was perceived; Mason 1996 reckons, to my mind correctly, that for Spinoza legality was secondary with respect to causality.

³³ Malebranche 1674-1675, écl. 8, écl. 10: III 85-86, 131. Leibniz 1710, 20: 114-115.

As we understand neither the Creator's designs or the relation between His nature and His attributes, writes Malebranche, the laws of Nature seem to depend on a purely arbitrary will, and we only know them by the sort of revelation constituted by experience³⁴. The signification of this arbitrary will in a system otherwise built upon divine Wisdom could be debatable, but Malebranche's empiricism is not a concession to scientific advances: as things do not truly have a nature, the laws of Nature are known to us only as constant relations. This arises from the distinction made by Malebranche between miracles and events conforming to the laws of Nature. An event is miraculous if it is produced from a particular will of God: something that appears ordinary may nonetheless arise from a particular will of God, and only divine revelation can allow it to be identified with certainty as a miracle³⁵. In practice, nonetheless, the constant correlation of two events is always the mark of a general law: when we observe that the collision of two bodies is always followed by the same effect, that a certain thought of the soul is always accompanied by a certain motion of the body, we can conclude that these are the result of general laws. Whatever the arbitrariness of God, according to Malebranche, the laws of Nature are known to us only by the constancy of certain relations.

Leibniz explicitly presented his position as a means of escaping from the arbitrary (represented by Descartes, Bayle or Malebranche) and from necessity (represented by Spinoza)³⁶. Defining miracles, as did Thomas Aquinas, as that which is beyond all created substance and beyond the understanding of all created mind³⁷, Leibniz insists that the frequency of an event is only an external accident³⁸. If he stigmatises Malebranche's occasionalist system, the Newtonian notion of universal gravitation and Locke's hypothesis of a thought added to matter as miracles, it is because the constancy of a link is not enough to define a law of Nature: a law of Nature must express the nature of things and be appropriate to our reason³⁹. But the laws of Nature are nonetheless not necessary as are logical or mathematical truths: this is the meaning of the difference between essences and existences, between the examination of the possibles and the choice of the best of all possible worlds, between the principle of non-contradiction and the principle of sufficient reason, between, on the one hand, logical or mathematical necessity and, on the other hand, moral or metaphysical necessity. Because our

³⁴ Malebranche 1958-1967 XVII-1: 55. Also the letter to abbé Catelan, Apr. 1687, in *ibid.*: 44.

³⁵ Malebranche 1686a, II 1: 695-699. Malebranche 1688, 12 12: 294

³⁶ Leibniz 1710, 349: 321

³⁷ Leibniz 1687, 17: 441-442. Leibniz 1687, 7: 432 is Malebranchist in the conciliation of general and particular wills. Leibniz 1710, 206-207: 240-241 refuses however to define miracles as the product of a primitive particular will of god: anything God wants, He wants in general.

³⁸ To Arnauld, 30 Apr. 1687, in Leibniz 1686-1690: 93-96.

³⁹ Leibniz 1686-1690: 93-94. Leibniz 1695: 483. Leibniz 1698-1702: 520, 587-588, 594-595. Leibniz 1710, 355: 326. For a more thorough examination of the theses of Malebranche and Leibniz, see Rutherford 1993.

world is the best of all possible worlds, the consideration of the ends and the final causes may also facilitate their apprehension⁴⁰.

The universality of the laws of Nature: the principle of simplicity of the ways

According to Malebranche, when God created the world, He considered not only the perfection of His work, but the perfection of His action. For His action to be perfect, it had to conform to His attributes, and in particular to His wisdom. To act wisely is to act not in a composite manner, but with simplicity, universality and generality, hence what Malebranche calls the principle of the simplicity of the ways: God determined to produce the world that he could produce and preserve according to simple, universal and unchanging laws⁴¹. The principle of simplicity of the ways constitutes a theological formulation of the idea of universal legality, the generalisation by the intermediary of God of the concept of the law of Nature formulated by Descartes in regard to the motion of a matter everywhere identical⁴².

The adjectives with which Malebranche qualifies laws vary, but can nonetheless be organised into distinct groups. Laws are uniform in time (constant, unchanging) or in space (universal, general); they cannot be broken (inexorable, invincible); they are simple, and “simplicity” may here be numerical (there is a small number of fertile laws), refer to the things themselves (laws concern basic entities) or to the manner in which we understand them (laws are easy to understand)⁴³. From these characteristics, it is obviously impossible to deduce the two laws that Malebranche supposes to be sufficient to explain all physical phenomena⁴⁴. In truth, they impose no constraints on content, but merely on form: any utterance can be a law, if it has the appropriate form⁴⁵. Legality is here metaphysical, in that it does not refer to a specific type of being, but defines the mode of action of God in every domain, including that of Grace. It is thus that the controversies of the 1680-1710 period concerned the metaphysical notions mobilised by the principle of simplicity of the ways: simplicity, wisdom and perfection.

⁴⁰ Leibniz 1697: 303-304. Leibniz 1710, 344-351: 318-323.

⁴¹ Malebranche 1674-1675, *écl.* 8 § 1: 86. Malebranche 1680, I 12-14, II 51: 27-30, 109-110. Malebranche 1688, 9 10: 213-214.

⁴² Compare the definitions of Nature given in Malebranche 1680, *écl.* 1 § 3: 148 and in Kant, *KRV*, A 216/B 263, AK III: 184.

⁴³ According to Malebranche, these characteristics do not however imply a perfect regularity in phenomena (Malebranche 1674-1675, III II 10, VI I 4: 479, 276-278). On the irregularity of meteorological phenomena, see Daston in this volume.

⁴⁴ These two laws state that motion is conserved in straight lines, and that it is communicated by the lesser pressure (Malebranche 1674-1675, *écl.* 16, § 19: 304-305. Malebranche 1680, I 15: 30).

⁴⁵ The laws mentioned after those regulating the communication of motions, the union of the soul and the body, etc., can raise doubts as to what exactly this form is (Malebranche 1688, 13 9: 319-321). Hence perhaps the remark that there are “plutôt vagues que générales et plutôt incertaines et hasardeuses que véritablement fécondes” (Bossuet 1687: 447).

For Arnauld, the simplest action has two distinct meanings, depending on whether the action is considered in absolute terms or relative to a certain end. Yet, if the simplest means to obtain a given result must be preferred to more complex means, in absolute terms, it is better to have a perfect circle drawn with a compass than an imperfect circle drawn more simply, that is to say without an instrument. Malebranche's error is thus, according to Arnauld, in surreptitiously moving from the relative to the absolute, in taking the simplicity of the ways as a quality in and of itself, forgetting that the ways are for the work, not the work for the ways⁴⁶. Similarly, Fontenelle underlines that fact that it is better to act wisely than simply, “se servir de moyens imparfaits, que de manquer quelquefois sa fin” : a watch with ten gears that keeps time is better than one with only five gears that does not. “On a fait le monde imparfait, pour le faire simple. Il fallait le faire parfait, et puis le faire le plus simple qu’il eût été possible”⁴⁷.

Arnauld and Fontenelle do not want to reduce wisdom to simplicity; Fénelon, taking as his own the notion of perfection that Augustine had opposed to the Manicheans, refuses to apply any process of maximisation to divine creation. All creatures, even an inanimate atom, surely bear the mark of the infinite perfection of God in the very fact that they were created, that is to say drawn from nothingness, yet for all that, creation is not determined by the search for maximum perfection. To suppose that creating a world is better than creating an atom is to differentiate among degrees of perfection, and thus to attribute reality to evil, when in fact it is nothingness⁴⁸. To suppose that there exists a best of all possible worlds is to give limits to the power of God⁴⁹. Moreover, the multiplication of rules for the work cannot alter the intrinsic simplicity of the action of God: the distinction between particular will and general will, between composite work and simple work, between exception and rule, is not real for Him⁵⁰.

The universality of the laws of Nature and the particular will of God

The principle of simplicity of the ways is the theological generalisation of the idea of universal legality. At the moment it was expressed, this idea presented a general problem: could it be reconciled with the particular providence which had thus far been supposed by the

⁴⁶ Arnauld 1685b, I 1 7, I 8 5, II 1, II 24, II 25, II 26 6: 179-182, 188-190, 244-245, 583, 587, 597-598. Malebranche indicates that God takes into consideration both the perfection of the work and the perfection of the ways, but these are two independent parameters, between which God must choose, and it is because He sometimes prefers the perfection of the ways that evil exists (Malebranche 1688, 9 10-11: 213-220). Leibniz insists to the contrary that God is able to manage both the ends and the means (Leibniz 1710, 208: 241).

⁴⁷ Fontenelle 1686: 542-545. Malebranche 1686b: 581-582 justifies the imperfections of our world not as the consequence of the principle of simplicity of the ways, but as a means for the eternal Temple.

⁴⁸ Fénelon 1687, 3, 9: 328-331, 345-346.

⁴⁹ *ibid.*, 1687, 16: 363-364.

⁵⁰ *ibid.*, 4, 16: 331-333, 360-364.

Christian religion? This problem appeared distinctly regarding three objects: monsters, miracles and the creation of animate beings and the world in general.

Monsters pose the problem of evil: how can evil exist in a world created by a good and all-powerful God⁵¹? According to Malebranche, the existence of evil cannot be denied, nor its reach minimised: disorder is everywhere present, and there exist in the physical world monsters, and in the moral world, the damned⁵². Yet, he insists, evil is not desired as such: it results indirectly and by accident from the general laws which God Himself cannot break without undermining the principle of simplicity of the ways; God allows it to exist without making of it the object of direct and particular wills⁵³. Malebranche thus recognizes the existence of evil, adding, however, that God did not expressly wish it.

For Arnauld, this was Malebranche's first renunciation of the notion of particular providence, by which God creates each creature and continues afterwards to look after each of them by His particular will. Monsters do not constitute in and of themselves disorders, but are only bad in relative terms, he explains, adopting Augustine's analysis of evil. They are imperfect relative to more perfect creatures; they are imperfect relative to our powerlessness to know God's designs. In our inability to judge things, we must therefore affirm in general that each creature is directly willed by God and conforms to His designs⁵⁴.

The problem posed by miracles is to know how to preserve their metaphysical possibility once the idea of universal legality is accepted⁵⁵. Arnauld, Fénelon or Bossuet observe that to insist on the universality of the laws of Nature as does Malebranche is to risk casting doubt on

⁵¹ For a long history of the *praeter naturam*, see Daston and Park 1998. The controversies which took place at the Academy of Science in the 18th century were the direct heirs to the conflict between Malebranche and Arnauld: monsters are considered either as the result of rare or random combinations of the general laws of Nature, or as the direct products of the will of a fanciful God (on these controversies, see Roger 1993: 397-418. Tort 1997. Monti 2000).

⁵² On the reality of evil as a fundamental theme for Malebranche, see Gouhier: 71. Moreau: 88-95, 110-126. As monsters are to the physical world what the damned are to the moral, in the question of monsters, there is a theological issue which I will here ignore.

⁵³ Malebranche 1680, I 18, 19, 22: 31, 32, 35-36. Malebranche 1685, 8 § 8: 522. Malebranche 1686a, I 1 3, 4, 7, I 1 11, II 3, III : 651, 653-655, 662, 683, 720, 764-765. Malebranche 1688, 9 9, 11: 212, 215-216. Bayle at first took the side of Malebranche (Bayle 1682, 66, 230: 44, 139-140); for a genetic analysis of Bayle's positions with respect to Malebranche, see Mori 1999: 89-154.

⁵⁴ Arnauld 1685b, I 2: 203-204.

⁵⁵ For a summary of the theoretical question of miracles, see Lenoble 1943. Hazard 1961: 207-239. Toccane 1978: 115-134. For an analysis of the practices, see Viguerie 1983. For presentations of the doctrines of Spinoza, Malebranche and Leibniz, see, *resp.*, Vernière: 164-185, Gouhier 1926: 55-68 and McRae 1985.

generally accepted miracles⁵⁶. In fact, Spinoza had deemed that it was not reasonable to dissociate the power of God and the power of Nature to seek proof of the existence of the former in the apparent deviations from the order of the latter. First, the laws of Nature are decrees that flow from the nature of God, who cannot produce anything that contradicts them without contradicting himself. Second, miracles are by definition beyond our understanding, and thus cannot let us know God. There is therefore no point in seeking the power of God elsewhere than in legality: the laws of Nature manifest in their own way the infinite, eternal and unchanging nature of God⁵⁷.

Leibniz and Malebranche diverged both on the subject of miracles and on the correlative notion of the laws of Nature; they nonetheless adopted similar strategies to deal with the possibility of miracles in the context of universal legality. They distinguish first between miracles in the philosophical sense (that which goes beyond the forces of creatures for Leibniz, that which God wants from particular will for Malebranche) and miracles in the popular sense (monsters and prodigies that surprise us)⁵⁸. This allows them to disqualify certain miracles as merely popular, and to drastically reduce their number⁵⁹. They then establish a hierarchy between two types of legislation: miracles violate certain subordinate maxims of Nature, but they nonetheless conform to the general order; what seems to be extraordinary only appears so relative to particular and subordinate rules⁶⁰.

Malebranche denied the existence of particular wills for monsters, he reduced their number in the case of miracles, but multiplied them liberally in regard to creation. Whereas Descartes had asserted that the laws of Nature could explain the formation of our world from an initial formless state of matter, Malebranche affirmed that these laws began to rule the world only once it had been formed, differentiating the first creation and its subsequent maintenance⁶¹. Likewise, he pruned off a great deal from the essays in which Descartes attempted to explain mechanically the genesis of living beings: the laws of Nature are supposed to regulate only the growth of creatures; this is the theory of pre-existent germs⁶².

A recurring argument raised against him from then on is that there is no reason that God should act *sometimes* or *rarely* by particular wills. A choice must be made: either God,

⁵⁶ Arnauld 1685b, I 7-12, 16-17. For Bossuet and Fénelon, see the references given below in note 74.

⁵⁷ Spinoza 1972, 6: 751-758. Spinoza then demonstrates what the Scriptures call Providence is only the order of Nature and that the so-called miracles there to be seen can be explained by natural causes.

⁵⁸ Malebranche 1680 I 20-21 : 33-34. Malebranche 1686a, II 1: 695-696. Leibniz 1698-1702: 520.

⁵⁹ According to Malebranche, the miracles described in the Old Testament are only prodigies carried out by angels, and most acts of Grace can be attributed to Christ. Leibniz seems to favour such a solution in the letter to Clarke, Aug. 1716, 117.

⁶⁰ Leibniz 1687, 6-7: 431-432.

⁶¹ Malebranche 1688, 10 17: 247. Malebranche 1674-1675, VI II 4: 341 sqq.

⁶² Malebranche 1688, 10 4-5, 11 9-10: 225-232, 264-268. On this theory, see Roger 1993: 325-463.

favouring the perfection of His action, will always act by general wills at the risk of imperfection in his work, or, in order to achieve the greatest perfection of His work, He will not hesitate to resort to particular wills, notably to save the damned⁶³. Malebranche's error is to have sought an untenable compromise, wisdom and simplicity alternating in primacy in a system “bigarré”⁶⁴.

The efficacy of the laws of Nature and the wills of the Creator

Once the idea of universal legality is accepted, the existence of monsters, the possibility of miracles and the creation of animals pose *a parte Dei* a sole and self-same problem: can the order of the particular wills and acts of God subsist, or is it subsumed by the universal legality? Yet again, the terms of the problem can be decoded in the reactions raised by the theses of Malebranche.

According to Malebranche, for something to exist, a general law of God is sufficient: the laws of Nature are only the general wills of God⁶⁵; His power and His will are identical when they are general; a general will is always practical, that is to say is followed by an effect⁶⁶. On the contrary, it may be that a particular effect does not result from a particular will, but may come into existence as the indirect consequence of general laws (this is the case for monsters). In this sense, God has certain particular wills that are not followed by effects and He can be said impotent; this is the meaning of the distinction between “vouloir” and “vouloir faire”, between “avoir des volontés particulières” and “agir par volontés particulières”⁶⁷. General laws are thus sufficient for the production of particular effects, while particular effects do not require a particular will: the general and the law are not the sum of the particular and the wills, but rather that which dissolve them⁶⁸.

Against these theses, Arnauld began by distinguishing between laws and wills⁶⁹. Certainly, by definition laws are general, but they are only the order by which things are done: what ensures that an event takes place is not a law but an act of will. Yet any effective will, will followed by an effect, is particular. Thus “tout ce que l’on peut dire pour parler exactement est que Dieu agit par volontés particulières en conséquence des lois générales”⁷⁰. As a result, if God does all, it is not from having willed the world in general: for anything to be, He must have

⁶³ Arnauld 1685b, I 4 à 6, II 25: 214-230, 588-590. Arnauld 1685c, 2, 3: 28-30, 42-43. Fénelon 1687, 12, 13, 16: 349-353, 354-356, 361-363. Bayle 1707, II 17: 64-65.

⁶⁴ Fontenelle 1686, 4: 544. Bayle 1684-1687, Aug. 1685, art. 6: 533. Bayle 1704a, 110: 339.

⁶⁵ Malebranche 1686a, I 1 4, II 3: 654, 723.

⁶⁶ Malebranche 1680, I 12: 27. Malebranche 1674-1675, VI II 4: 316.

⁶⁷ Malebranche 1685: 525-527. Malebranche 1686a: 650-655

⁶⁸ Arnauld 1685b, II 18, 22: 539, 566 insists that the centre of Malebranchism is the negation of particular wills.

⁶⁹ Arnauld 1685b, I 1 2, 6: 175, 179.

⁷⁰ Arnauld 1685a, 7: 737. Arnauld 1685b, I 1 2: 175.

willed it in particular, and this will is sufficient⁷¹. It is only by impotence and imperfection that our kings govern by general orders, that they choose to build a palace less costly but less beautiful than it might be: the details of things do not weary God, nothing is taxing for Him, it is enough that He wills something for it to be⁷². If this were not the case, God would not strictly speaking want anything: he would not want monsters, but nor would He want the perfect animals; He would not want rain on a sterile Earth, but nor would He want it on a fertile earth: He would be satisfied with following His laws, He would be indifferent to creatures⁷³.

In fact, Arnauld, and later Bossuet and Fénelon, only distinguish between the order of legality and the efficacy of wills so as to guarantee the possibility of their co-occurrence; this is what is demonstrated in particular by the "hidden miracles" of the biblical tradition, miracles that conform to the general laws, but are nonetheless willed by God to fulfil a particular plan. According to them, to deny the possibility of such an over-determination is to eliminate any reason to pray to God or to believe in Providence, it is to make all things equally natural and to become an Epicurean⁷⁴. That we are in general powerless to know one of the co-occurring terms (God's plan) must not lead us to doubt its existence; it may even be possible that the purpose of the general laws is to hide from us the perpetual operation of God behind the veil of the regular course presented by the operations of Nature⁷⁵.

The obedience of creatures to the laws of Nature: causality and the nature of things

If the metaphor of laws is taken seriously, laws are not relations, but the commandments of a lawmaking God. There then arises the problem of determining how material things can conform to these laws when they lack the intelligence to understand them. To this problem must be added, in the context of Malebranche's occasionalism, the problem of knowing how material things can execute these laws when they lack force. Indeed, occasionalism consists in the thesis that creatures are but occasional causes, and that God is the true cause of all that occurs in the world; Malebranche bases this thesis on two arguments⁷⁶. The first is the incomprehensible character of causality in regard to Cartesian ontology — in the elementary case of colliding

⁷¹ Arnauld 1685b, I 1 2, I 2 2, I 2 5, I 8: 175, 192, 203, 237. This position concerning Nature has its theological corollary: the heart of Jansenism is that Grace is always effective, that is to say that God saves all those He wants to save, and consequently He did not want to save the damned.

⁷² Arnauld 1685b, I 1 5, I 2 1: 178, 189-190. Fénelon 1687, 16: 362-363. Bayle 1704b, 155: 825-826. This remark is particularly pertinent against the presentation of the principle of simplicity of the ways given in Malebranche 1675-1676: 504-509. On the Malebranchist impotence of God, see the references given above in note 26.

⁷³ Arnauld 1685b, I 8 4: 243-244.

⁷⁴ Arnauld 1685b, I 1 4, I 8 2-3, I 10, I 13 I 14 66 3-4: 176-178, 238-241, 257-264, 280-288, 294-302. Fénelon 1687, 15, 18: 358-360, 367-371. Bossuet 1687: 444. See also the commentaries of Moreau 1999: 241 sqq.

⁷⁵ Arnauld 1685b, I 2 2, 4: 191, 199-201. Fénelon 1687, 14: 356-357.

⁷⁶ Malebranche 1675-1676, VI II 3: 312-316. Malebranche 1685, 7-8: 513 sqq. Malebranche 1686a, II 1: 700-704. Malebranche 1686b: 584. For a recent summary of the historical significance of occasionalism, see Nadler 1993.

bodies, one cannot understand the communication of the force of motion, whether it is a mode or a substance. There is however a necessary link between the will of an omnipotent being and the real motion of a body, insomuch as our idea of an omnipotent being implies the efficaciousness of His will⁷⁷. The second argument is that God cannot divest himself of His essential power to make all that is real in creatures, and that we honour him better by supposing Him to be the cause of all things than do the pagans with their secondary causes.

The adversaries of occasionalism sought first of all to define causality so as to distinguish it from legality. Causality can be presented in the form of logical necessity: the cause implies the effect, the effect cannot be without the cause⁷⁸. But Malebranche showed the specificity of the causal link: it can be confused neither with an empirical regularity, nor with logical necessity⁷⁹. One thus seeks to hem it in with supplementary clauses: the effect must take place promptly, says Arnauld⁸⁰; the true cause must contain its effect, be proportional to it, be able to produce it, says Villemandy⁸¹. But in drawing attention from legality to causality, from the observation of regularities to their effectiveness, the principal reaction against occasionalism was to rehabilitate the notion of individual nature and moving force.

Fontenelle remarks that universality can be expressed in three distinct manners depending on the relation between the action and the subject on which it acts. The action can be indifferent to the nature of the subject (it is indifferent to pieces of metal to be transformed by a machine), the action can conform to the nature of the subject (a machine is made to be set in motion); an action can go beyond the nature of the subject (it is not in the nature of a machine to be constantly repaired). What makes for the perfection of an action is not uniformity as such, but uniformity insofar as it manifests wisdom (not to ask of a subject more than it can produce) and intelligence (to put in the appropriate disposition to produce the wanted effect). A world like that of Malebranche, in which bodies cannot themselves communicate motion to each other, will thus not be endowed with the most perfect uniformity, that in which reign laws that conform to the nature of subjects and such that they can execute them themselves. To endow a world with general uniformity, it is necessary to entrust the execution of laws to subjects so that they do no more than obey the instituted laws: that is to say that they have a nature, that God has endowed them with the means to move, that is to say, with moving force⁸².

It is with the support of his new dynamics, which established the conservation of quantity of force and motive action, that *De Ipsa natura* pursues the rehabilitation of the scholastic forms

⁷⁷ Which is not to say that we still do not know the means of action of the will of God (Malebranche 1683 IX 2: 96. Malebranche 1686b: 581). On the obscurity of the divine will according to Malebranche, see Moreau: 227-232.

⁷⁸ Arnauld 1985a 2: 701. Arnauld 1685b I 1 3: 176. Fontenelle 1686 3: 533.

⁷⁹ Malebranche 1675-1676 III II 3: 426-428. Bayle 1686: 569-571.

⁸⁰ Arnauld 1985a 2: 701. Arnauld 1685b I 1 3: 176

⁸¹ Bayle 1684-1687, Aug. 1686, art. 6: 623 quotes and approves the definition of Villemandy.

⁸² Fontenelle 1686, 5: 542-558.

made public in the *Discours de métaphysique*. If the laws decreed by God were only extrinsic denominations, things could not conform to them; they must therefore have kept some trace, however vestigial, of this first commandment, and have the inherent force to execute it: this force is what is called nature or form⁸³. Alongside the general laws that Leibniz qualifies as “maximes subalternes”, individual laws must be added: each substance acts uniformly in so far as it has a law, that is to say a series of relations that determine the sequence of its actions⁸⁴.

Except perhaps for Leibniz himself, the nature of this force was however not easy to grasp. Bayle remarked that regular, or least determined, actions imply an intelligence that establishes laws, but also an intelligence that executes them. Creatures that cannot know how or when or where to apply the laws they are given cannot follow them: without knowledge, we are incapable of building a machine, of sewing a button, or writing a poem; if it occurs that beings without intelligence act in a determined fashion, it is because they are directed by intelligent causes⁸⁵. Two solutions are then possible: either this intelligence is within God, and we adopt the system of Malebranche, or this intelligence is in creatures, and we are dealing with the hylarchical principles of Henry More, the seeds of Daniel Sennert, the plastic faculties of Jean Le Clerc, the forces of Leibniz, and other intermediate intelligences useful for not keeping God toiling at the spinning wheel, but that are just as apt to let us do without Him once the world is created, thus taking us back in practice to the atheism of Straton⁸⁶.

Conclusion

Not only do these texts not produce any science, they are behind the science of their own time: the only example of "law" they give it that a stone falls when it is released. They nonetheless cannot be dissociated from certain changes induced by the new sciences, in particular by the Cartesian claim that there exist rules of motion that are full-fledged laws of Nature, and that thus determine all the effects that can consequently be observed⁸⁷. The knowledge of universal laws that regulate the path of motion allows the "new philosophers" to

⁸³ Leibniz 1698: 503-507. Leibniz 1698-1702: 548. Bayle 1740, art. “Rorarius” (rem. L): IV 920 having objected that it is difficult to lay out lines in simple and immaterial substance, Leibniz responds that this is what happens in the case of relations, expressions, representations (Leibniz 1698-1702: 551).

⁸⁴ Leibniz 1698-1702: 520.

⁸⁵ Bayle 1686: 574. Bayle 1704a, 110-111: 340a-341a. Bayle 1706, 4: 995-996. To respond to this argument, Leibniz advances the theory of little perceptions: we do not truly know what we will do in ten years time, but we can perceive it in a dim and confused way (Leibniz 1698-1702: 521, 550). On the discussion of Bayle and Leibniz, see Lennon 1993.

⁸⁶ Bayle 1704a, 110-111: 339 sqq. Bayle 1704b, II 179-181: 882-890. Bayle 1740, art. “Morin, J.-B.” (rem. M.) art “Plotin” (rem. G.), art. “Ricius” (rem. C), art. “Sennert” (rem. C, rem. F): IV 264, IV 705-706, IV 875, V 113, V 116. According to Mori 1999: 142-146, Bayle 1704a, 106, 114: 336a, 348a would imply agreement on the position of Straton.

⁸⁷ Descartes 1633: 37, 47. For an analysis of the Cartesian concept of the law of Nature, see Roux 1999.

set themselves apart from the ancient atomists, who supposed that everything happens by chance⁸⁸.

The reach of the Cartesian statement cannot however be reduced to the determination of certain effective laws of motion. Because the laws of motion are laws of Nature, he installs in the physical domain the idea of universal legality: Nature is everywhere homogeneous, it is regulated by constant and uniform laws. It is this idea that Malebranche takes as a theme and extends beyond the strictly physical; it is the consequences of this idea that the controversies of 1680-1710 analyse. In fact, the historical paradox of these texts is that they stabilised the use of the metaphor of law in the sciences when their ostensible purpose was to question its pertinence and limits.

For us, aware of more recent research on the notion of the laws of Nature, these controversies echo strangely: the terms used are the same as those employed today (causality, universality, necessity, simplicity, etc.), but they are linked to theological problems which are foreign to us. One can certainly think that the theological formulation of these problems renders them inseparable from a theological problem. Should not the task of our Godless, and moreover, post-critical, period, therefore be to forget them as quickly as possible⁸⁹? And yet, it is not certain that we have finished with the three questions we have discussed: what is contingency and physical necessity? What are the characteristics of the paradigm of legality and can it be extended from the physical to other fields of knowledge, or even to the entire human experience? What are the prerequisites imposed by the idea of universal legality on the nature of things and the way in which we can know them?

⁸⁸ Lamy 1683: 256-257. For a parallel between the notions of limit in ancient atomism and of law in 17th-century mechanism, see Wilson in this volume.

⁸⁹ See on this subject, Van Frassen 1989.

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