TIME AND NATURE
IN LUCRETIUS' "DE RERUM NATURA"

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Translations of the Latin quotes
appended at the end.

I: Theme

In book one of "De rerum natura", in the context of a discussion of properties and accidents of things, Lucretius defines time as accident of motion (1, 459-82):

> tempus item per se non est, sed rebus ab ipsis
> consequitur sensus, transactum quid sit in aevo,
> tum quae res instet, quid porro deinde sequatur;
> nec per se quemquam tempus sentire fatendumst
> semotum ab rerum motu placidaque quiete.
> (1, 459-63)[1]

The two distinguishable aspects of time are: 1) its dependence on motion and rest of things, and 2) its dependence on human perception. Epicurus, in his work Περὶ φύσεως, had defined time as φαντασία τις ... κινήσεως πάσης καταμετρητική, as "a certain measuring perception of any motion"[2]. In Lucretius' definition, however, where "sensus" and "sentire", where "feeling" takes the place of φαντασία τις ... καταμετρητική, of "a certain measuring perception", the measuring aspect of the human perception seems to be lost. This difference from Epicurus, in definition, as far as the one distinguishable aspect of time, its dependence on human perception is concerned, appears to be heightened, in the body of the text, with respect to the other distinguishable aspect of time, its dependence on motion and rest of things. Throughout Lucretius' philosophical poem, time is spoken of as space, as motion and as force, most

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[1]The three terms: "tempus", "aetas", "aevum", seem to be used in such a way that "tempus" denotes the most abstract, "aevum" the most concrete aspect of time, while "aetas" covers both, abstract and concrete meaning.

[2]Pap. Herc. 1413, Fr. 55, A. BARIGAZZI, ed. and comm., Il concetto del tempo nella fisica atomistica, Epicurea in mem. d. Pigmone, Genova, 1959, 25-59, p. 38.

compactly in a line of book five (1276): "sic volvendo notas commutat tempora rerum," "thus rolling time changes the times of things."

In the course of this essay, two related questions will have to be clarified: 1) What is the connection between these three different metaphors of time, between time as space, time as motion and time as force? And 2) What is the common ground for this poetic view of time and the philosophical definition of it as accident of motion?[3]

Lucretius' account of time as space ranges from general to particular, and from quantitative to qualitative meaning: things happen in time, in smaller or larger amounts of time, or things have their times, their youth, their maturity and their old age. The dependence of time on bodies in motion through space seems to be transformed into a correspondence between spatially extended motion and time, expressed metaphorically as space of time (cf. 6, 300-3; 1, 326-7). The notion of time as space, with a mere quantitative meaning, ranges from infinitely great to infinitely small, most paradoxically from the whole of time to the point of time, and thus mirrors the sum of things, always the same and not the same, infinite matter infinitely in motion through infinite

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[3]For a more extensive study of the epicurean concept of time, cf. my Diss., G. NECK, Das Problem der Zeit im Epikureismus, Heidelberg, 1964, ch. 1, Zeitbegriff, pp. 14-74.

space.[4] Time as space, however, is mostly conceived with a qualitative as well as quantitative meaning. Things not only happen in time, in smaller or larger amounts of time, they also have their times, their youth, their maturity and their old age. The most striking example for this usage is the account of the birth (2, 1105-6), growth (2, 1105-30, esp. 1120-1, 1123, 1127), maturity (2, 1130), decay (2, 1131-74, esp. 1131-2, 1145), and death (2, 1150, 1166, 1169, 1172-4) of our world, at the end of the second book of "De rerum natura." If we keep in mind that time had been defined as accident of motion and that, in the expression space of time, it had been substituted metaphorically for the space measured through by motion, the coincidence of quantitative and qualitative meaning of time has to be understood as a correspondence between a phase in the motion of a body through space, and the space of time, depending on this phase of the motion, but now expressed as phase of the moving body itself.

The safeguarding condition for this substitution of the accident time for the body in motion is the occurrence of

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[4] In the epicurean understanding of infinite matter infinitely in motion through infinite space, time, being an accident of motion, is also infinite. The paradox "whole of time" has to be taken as a concession to man's desire to comprehend the object of his thought and speech (cf. my Diss., op. cit., pp. 37-40; for the theme of infinity in all its different aspects, cf. R. MONDOLFO, L'infinito nel pensiero dell' antichità classica, Firenze 1956). The other paradox "point of time" has to do with the connection of continuity and infinite divisibility of time (cf. my Diss., op. cit., pp. 19-20, 39-40; cf. J. MAU, Zum Problem des Infinitesimalen bei den antiken Atomisten, Berlin 1954).

motion in accordance with fixed laws:

> doceo dictis, quo quaeque creata
> foedere sint, in eo quam sit durare necessum
> nec validas valeant aevi rescindere leges.
> (5, 56-8, cf. 2,302)

These laws, sometimes called the laws of nature, sometimes the laws of time, determine the phases of the different spaces of time, which quantitatively and qualitatively distinguishable make up the life of a body in motion. The perception of different phases, within the lifetime of a moving body, leads to the second metaphor of time, to time as not only space for motion, but also motion itself.

Motion of time appears most naturally in connection with the motion of heavenly bodies, where at times the heavenly body, at other times the time determined by it, is seen in motion (5, 692; 1, 311; 5, 1183-5). The other most striking example stems from the account of man's cultural development, and combines all three metaphors of time, time as space, motion and force: "sic volvenda aetas commutat tempora rerum," "thus rolling time changes the times of things" (5, 1276; cf. 2, 1172 The natural or cultural change of things can be grasped in three aspects: 1) the different phases of the development are determined quantitatively and qualitatively by the metaphor space of time as "tempora rerum," as "times of things," 2) the dynamic character of the succession of different phases is caught, in the metaphor motion of time, as "volvenda aetas," as "rolling time," and 3) the cause of change, inherent in the nature of things, is recognized, in the metaphor force of time, as "volvenda aetas commutat tempora rerum," as "rolling time changes the times of things." This means that the whole

phenomenon change, in its three aspects: cause, mode of being, and effect, is mirrored as time.

Time as force seems to be the one metaphor most remote from the epicurean understanding of time as accident of motion. It, nevertheless, is the one which occurs most frequently in Lucretius' "De rerum natura." Change appears to be caused both by forces inherent in things and caused by the force of time: "we perceive all things flow away, as it were, in the long lapse of time, as age withdraws them from our sight" (2,69-70) and "if time utterly destroys, whatsoever, through age, it takes from sight" (1, 225). The comparison of the two quotes shows that, first, "age, in the long lapse of time", then "time, through age", seems to effect change in things. The space of time which has to be measured through by things subject to change is conceived as having changing influence on them:

> omnia enim debet, mortali corpore quae sunt,
> infinita aetas consumpse ante acta diesque.
> quod si in eo spatio atque ante acta aetate fuere
> e quibus haec rerum consistit summa refecta,
> immortali sunt natura praedita certe.
>
> (1, 232-6; cf. 551-64)

This powerful influence, sometimes called "the forces of measureless time" (5, 377-9), is not only seen as a general impact on things, as "infinita aetas," as "infinite time," but also as a particular impact, graspable in successive moments of time as "ante acta dies," as "the gone by day." The destructive force of time, appears to be so strong that things are imagined to suffer under the "torments of time":

> Denique non lapides quoque vinci cernis ab aevo,
> non altas turris ruere et putrescere saxa,

non delubra deum simulacraque fessa fatisci
nec sanctum numen fati protollere finis
posse neque adversus naturae foedera niti?
denique non monimenta virum dilapsa videmus,
(quaerere proporro, sibi cumque senescere credas,)
non ruere avolsos silices a montibus altis
nec validas aevi vires perferre patique
finiti? neque enim caderent avolsa repente,
ex infinito quae tempore pertolerassent
omnia tormenta aetatis, privata fragore.
(5, 306-17)

The force of rolling time changing the times of things (5, 1276) is finally spoken of as changing the nature of the world:

mutat enim mundi naturam totius aetas
ex alioque alius status excipere omnia debet
nec manet ulla sui similis res: omnia migrant,
omnia commutat natura et vertere cogit.
namque aliud putrescit et aevo debile languet,
porro aliud (suc) crescit et (e) contemptibus exit.
sic igitur mundi naturam totius aetas
mutat, et ex alio terram status excipit alter,
quod potuit nequeat, possit quod non tulit ante.
(5, 828-36)

II: Development

In order to 1) clarify the connection between the three different metaphors of time, and 2) discover the common ground for the poetic view of time and the philosophical definition of it, we will have to consider the relation of time to nature, the key term in Lucretius' "De rerum natura."

Inextricably connected with change of things, force of time in motion of time through space of time cannot act outside or against nature (2, 297-307; cf. 5, 306-10). Change of things, whether growth or decay, occurs under the laws of both: time and nature:

> doceo dictis, quo quaeque creata
> foedere sint, in eo quam sit durare necessum
> nec validas valeant aevi rescindere leges.
> (5, 56-8; cf. 2, 302)

What does it mean to speak of time, changing the nature of the whole world, of nature, altering all things, and, again, of time, changing the nature of the whole world (5, 828-36)?

Epicurus, daring to go beyond the flaming walls of the world and to break open the tight locks of the gates of nature (1, 66-77), came back victoriously with the knowledge of "what can come to be, what cannot, finally how each thing has its power defined and its deep-set boundary mark." Nature,[5] as the totality of being and non-being, of coming into being, and going out of being, is matter in motion through space (1, 419-21), which brings forth birth and death of things:

> Nunc age, quo motu genitalia materiai
> corpora res varias gignant genitasque resolvant
> et qua vi facere id cogantur quaeque sit ollis
> reddita mobilitas magnum per inane meandi,
> expediam: tu te dictis praebere memento.
> nam certe non inter se stipata cohaeret
> materies, quoniam minui rem quamque videmus,
> et quasi longinquo fluere omnia cernimus aevo
> ex oculisque vetustatem subducere nostris,
> cum tamen incolumis videatur summa manere
> proptereea quia, quae decedunt corpora cuique,
> unde abeunt minuunt, quo venere augmine donant.
> illa senescere, at haec contra florescere cogunt,
> nec remorantur ibi. sic rerum summa novatur
> semper, et inter se mortales mutua vivunt.
> augescunt aliae gentes, aliae minuuntur,
> inque brevi spatio mutantur saecla animantum
> et quasi cursores vitae lampada tradunt.
> (2, 62-79)

On the basis of this creative and destructive force, nature herself seems to be above the process of matter in motion

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[5] For a comprehensive study of the concept of nature in Lucretius' "De rerum natura," cf. K. SALLMANN, Studien zum philosophischen Naturbegriff der Römer mit besonderer Berücksichtigung des Lukrez, Archiv für Begriffsgeschichte, 7, 1962, 140-284

through space (1, 55-9; cf. 2, 1067-74). However striking this impression might be, Lucretius never tires of reminding us of the truth that nature only explicates the hidden characteristics of matter. Matter in motion through space results, however, in definite ways of growth and decay, a fact which allows for terms like "foedera naturai," "bonds of nature," or "pacta naturae," "pacts of nature":

> quo propter quo nunc in motu principiorum
> corpora sunt, in eodem ante acta aetate fuere
> et post haec semper simili ratione ferentur
> et quae consuerint gigni gignentur eadem
> condicione et erunt et crescent vique valebunt,
> quantum cuique datum est per foedera naturai.
> (2, 297-302)

The problematic character of expressions like "in a similar way" and "such things as have been wont to come to being, will be brought to birth under the same condition" indicates, however, that the "bonds of nature" provide no more than a framework for experimentation of matter in motion through space:

> nam certe neque consilio primordia rerum
> ordine se suo quaeque sagaci mente locarunt
> nec quos quaeque (darent motus pepigere profecto)
> sed quia multa modis multis mutata per omne
> ex infinito vexantur percita plagis,
> omne genus motus et coetus experiundo
> tandem deveniunt in talis disposituras,
> qualibus haec rerum consistit summa creata,
> et multos etiam magnos servata per annos
> ut semel in motus coniectast convenientis,
> efficit ut largis avidum mare fluminis undis...
> (1, 1021-31; cf. 5, 416-42)

What can be the criterion for "convenient movements" in a world too faulty to be created by gods (5, 187-234) and continually engaged in a war between life and death (2, 569-80)? The repeated example of nature trying (5, 837-924), but being unable to create monsters (1, 199-204; 2, 700-29) suggests that "convenient movements" must mean stability of growth, maturity

and decay. The formula for nature: "what can come to be, what can not, finally how each thing has its power defined and its deep-set boundary mark" (1, 75-7) is explicated in the account of "certain matter," responsible for things coming into being and going out of being at "certain times" (1, 159-214). Most compactly it is stated as "materiai concursus, motus, ordo, positura, figurae," as "meetings, motions, order, position and shapes of matter" (2, 1020-2; cf. 1, 675-8). The order of these terms follows the order of the process of recognition from complex mobility to simple stability: our senses perceive the reality of motion and rest of things; this reality, our mind uncovers as deceptive appearance, as atoms ceaselessly in motion. The true rest however, underlying that restlessness and establishing the conditions for the achievement of "convenient movements" is to be found in the "shape" of atoms. That "shape" of atoms bears special importance for the nature of a thing can be seen from its central position in book two, the book about motion and rest: After the Prooemium about motion and rest in terms of body and mind (2, 1-61), a positive treatment of motion and rest in terms of atoms (2, 62-332) leads over into the discussion of "shape" of atoms (2, 333-729), which in turn gives way to a negative treatment of colour and feeling in atoms (2, 730-864, 856-990). The Finale describes the sum of things in motion and rest, but now not in terms of atoms, as in the three main parts of the book, but, corresponding to the Prooemium, in terms of compounds, of worlds being born and dying (2, 991-1174).. Thus, book two shows a symmetry of pairs (motion and rest), grouped around a one (rest): the one being "shape" of atoms, the pairs being motion and rest in

terms of compounds in Prooemium and Finale, and motion and rest in terms of atoms in the first and third main parts of the book. The special importance of shape of atoms for the nature of a thing is shown in a quote of book five, from the description of the birth of our world:

> sed nova tempestas quaedam molesque coorta.
> diffugere inde loci partes coepere paresque
> cum paribus iungi res et discludere mundum
> membraque dividere et magnas disponere partes
> omnigenis e principiis, discordia quorum
> intervalla vias conexus pondera plagas
> concursus motus turbabat proelia miscens
> propter dissimilis formas variasque figuras,
> quod non omnia sic poterant coniuncta manere
> nec motus inter sese dare convenientis,...
> (5, 436-45; cf. 416-42)

Differently from platonic or aristotelian usage though, where shape (εἶδος , ἰδέα , or μορφή) means shape of or for a thing, in the epicurean context, all the factors, "materiai concursus, motus, ordo, positura, figurae," play their part in determining the appearance of a thing.

III. Recapitulation

The inquiry into the meaning of "nature," the key term of Lucretius' "De rerum natura", aimed at clarifying the relation of nature and time, and consequently the relation of the philosophical definition and the poetic metaphors of time.

The relation of nature and time becomes especially poignant in a passage from book one, where both concepts, time and nature, are coupled into one:

> Postremo quae cumque dies naturaque rebus
> paulatim tribuit moderatim crescere cogens,

> nulla potest oculorum acies contenta tueri,
> nec porro quae cumque aevo macieque senescunt;
> nec, mare quae impendent, vesco sale saxa peresa
> quid quoque amittant in tempore cernere possis,
> corporibus caecis igitur natura gerit res.
> (1, 322-8; cf. 628-34)

If one considers, at first, beginning and end of this statement, "whatever day and nature adds to things little by little" is restated in "by bodies unseen then nature treats things" (cf. 2, 127-8; 129; 132-141). The double force "day and nature" corresponds to one force, "nature," using the other force, "bodies unseen," in order to effect change. Change of things occurs "in time" and "through time and decay," that is, both from within and from without. "Day," in the double concept "day and nature," presents itself before "nature," since it is the force of time which makes us reflect about the force of nature, since it is the change of appearances which makes us reflect about the permanence of being. The term "day," implying a small, quantitatively and qualitatively defined unit of time, reminds us of the fact that change of things occurs in small steps, continually altering the parts of the sum of things. The sum of things, however, is held in balance by the permanent laws of nature. Time, reflecting change within the sum of things, is an accident of motion. As such, it is an accident of nature, since nature comprehends the whole scale of meanings from the creative and destructive power, governing the world, to the laws of growth and decay, determining the world, derived from the movements of atoms. "Dies naturaque, "day and nature," therefore, represents two aspects of one and the same truth: "dies," "day," stands for the changeable aspect

of appearances, the measurable actualization of infinite matter in infinite motion through infinite space; "natura," "nature," stands for the unchangeable aspect of being, the firm laws of infinite matter in infinite motion through infinite space.[6] The three metaphors of time: force of time, motion of time, and space of time, correspond to the three aspects of nature: matter, motion, and space. The interchangeability between nature and time, between substance and accident, explains itself through man's being more concerned with change than with permanence, and therefore more with time than with nature. Similarly, birth and growth, decay and death, are not presented equally under the influence of nature and time, but birth and growth more under the influence of nature, decay and death more under the influence of time. Once life has begun, man seems to be most concerned with its meaningful completion and therefore with time effecting change towards that end.

The relation of time and nature, in Lucretius' philosophical poem, can be grasped in another comparable pair of terms, in the relation of "fortune" and "nature." Subsequent

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[6]K. MARX, in his Diss., Differenz der demokritischen und epikureischen Naturphilosophie (MEGA 1, 1, Frankfurt a. M. 1927, 1-52), rather brilliantly portrays this connection of nature and time: "Die Zusammensetzung ist die bloss passive Form der konkreten Natur, die Zeit ihre aktuose Form...Die Zeit dagegen ist das Feuer des Wesens, das die Erscheinung ewig verzehrt und ihr den Stempel der Abhängigkeit und Wesenlosigkeit aufdrückt." (pp. 42-3). MARX's capture of the essentials, though, lacks support from working with the texts which would have prevented him from identifying Epicurus' and Lucretius' notion of time, and led him to notice the crucial co-existence of definition and metaphors of time in Lucretius' work.

quotes describe, first nature (5, 77), then fortune (5, 107), as governing the world. The context, however, makes it clear that fortune is neither an equal nor rival force to nature, but that "governing nature" provides the framework for "governing fortune": nature determines the general laws of the world, fortune only the particular moves, possible within those laws.

Similarly, the relation of nature and time, of substance and accident, was shown to consist in the relation of matter in motion through space and force of time in motion of time through space of time. The connection between the three aspects of nature, therefore, becomes the key for the connection between the three metaphors of time. The one to one correspondence of the three pairs indicates the special importance of matter, under the aspect of nature, the permanent, and of force, under the aspect of time, the changeable. The fact that force explicates matter, as time explicates nature, is the common ground for the poetic view of time and its philosophical definition, is the common ground for the metaphorical use of time as force, motion, and space, and its definition as accident of motion.

Theme, Development, and Recapitulation of this essay tried to understand how time, as accident, becomes interchangeable with nature, the substance of the world, which also entailed the substitution of the definition by metaphors of time. To understand "how" does not, however, mean to understand "why" this substitution takes place, a question to be answered by considering the second aspect of Lucretius' definition of time, its dependence on human perception.

IV: Coda

The first aspect of Lucretius' definition was time's dependence on motion and rest of things:

> tempus item per se non est, sed rebus ab ipsis
> consequitur sensus, transactum quid sit in aevo,
> tum quae res instet, quid porro deinde sequatur;
> nec per se quemquam tempus sentire fatendumst
> semotum ab rerum motu placidaque quiete.
> (1, 459-63)

The second aspect, time's dependence on human perception, implies both man's awareness and man's evaluation of time. Man's awareness of time, coming from "things themselves," stems from things of nature as well as things of human nature. The reason for distinguishing between these two, though connected, realms is man's different evaluation of time, whether nature or human nature is concerned.[7]

Within nature, as a whole, where the sum of things (2, 303; 1, 1008-9; 2, 307), through the constant cycle of life and death (2, 569-80), is always the same and always not the same (5, 828-36), and where development in time eventually means turning back to the beginning, time seems to become more and more negligible, the more one moves from the parts to the whole.[8]

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[7] Cf. P. DELACY, Process and Value: An epicurean dilemma, TAPhA, 88, 1957, 114-26.

[8] Cf. G. LEOPARDI, La ginestra, ll. 292-7: "cosi dell'uomo ignara, e dell'etadi ch'ei chiama antiche, e del seguir che fanno dopo gli avi i nepoti, sta natura ognor verde, anzi procede per si lungo cammino, che sembra star". cf. S. BORRA, Spiriti e forme affini in Lucrezio e Leopardi, Bologna, 1934.

Within the context of nature:

> et quasi longinquo fluere omnia cernimus aevo
> ex oculisque vetustatem subducere nostris,
> cum tamen incolumis videatur summa manere
> propterea quia, quae decedunt corpora cuique,
> unde abeunt minuunt, quo venere augmine donant.
> illa senescere, at haec contra florescere cogunt,
> nec remorantur ibi, sic rerum summa novatur
> semper, et inter se mortales mutua vivunt.
> augescunt aliae gentes, aliae minuuntur,
> inque brevi spatio mutantur saecla animantum
> et quasi cursores vitai lampada tradunt.
> (2, 69-79; cf. 3, 971)

This indifference of time and nature, with respect to any human content of life, moves man to resist nature for the sake of life:[9]

> Quod (si) iam rerum ignorem primordia quae sint,
> hoc tamen ex ipsis caeli rationibus ausim
> confirmare aliisque ex rebus reddere multis,
> nequaquam nobis divinitus esse paratam
> naturam rerum: tanta stat praedita culpa.
> principio quantum caeli tegit impetus ingens,
> inde avidam partem montes silvaeque ferarum
> possedere, tenent rupes vastaeque paludes
> et mare, quod late terrarum distinet oras.
> inde duas porro prope partis fervidus ardor
> adsiduusque geli casus mortalibus aufert.
> quod super est arvi, tamen id natura sua vi
> sentibus obducat, ni vis humana resistat
> vitai causa valido consueta bidenti
> ingemere et terram pressis proscindere aratris.
> (5, 195-109)

The difference between the description of the newborn child, crying in its helplessness (5, 222-7), and the young animals, largely taken care of by nature herself (5, 228-34), does not mean resignation before nature, but recognition of the need for development in the case of man: "One thing I feel able to affirm...: so small are the traces of nature left, which

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[9]For a more extensive study of the epicurean view of man's experience of time, cf. my Diss., op. cit., ch. 3, Zeiterfahrung, pp. 140-9.

reason could not dispel for us, that nothing hinders us from living a life worthy of gods" (3, 319-22). This task of man to overcome the indifference of time and nature, with respect to human life, takes on two, though related, forms: one is man's detachment from temporal things within his own lifetime, the other man's overcoming the temporality of his own life by seeing himself as part of mankind, and the development of his own nature as part of the development of the nature of man. Lucretius' description of the development of man, in book five of "De rerum natura" (5, 925-1457), ends with a rather complicated statement of the principles of change:[10]

> usus et impigrae simul experientia mentis
> paulatim docuit pedetemptim progredientis.
> sic unum quicquid paulatim protrahit aetas
> in medium ratioque in luminis erigit oras;
> (5, 1452-5)

As a quote from book four shows (4, 822-57), "usus", the first impelling force towards progress, means "practice" in the sense of both, action and reaction (cf. 4, 831, 835, 841, 852). Similarly, "impigrae experientia mentis" means "experience of the eager mind," both as process and as result. Coupling "practice" and "the experience of the eager mind" under one and the same verb, "taught," emphasizes the importance of human reason in the process of change. The last two lines of this statement of principles repeat the pattern of the first two lines: "aetas" and "ratio", "time" and "reason", are coupled as forces towards progress, "time" in the place of "practice," "reason" in the place of "the experience

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[10]For a more extensive study of the epicurean understanding of time as force of development, in nature or history, cf. my Diss., op. cit., ch. 2, Zeitfunktion, pp. 75-139.

of the eager mind." Two practical verbs, "brings out" and "raises up," supplant, in the last two lines, the more theoretical verb, "taught," from the first two lines, and thus effect a balance of theory and practice in both parts. The comparison between the two parts recalls the interchangeability between nature and time, between substance and accident, discussed earlier (5, 828-36). Here, in the context of the development of human nature, the process of change, which is seen, once under the influence of human action, once under the influence of time, has an added initiative in both cases: human mind or human reason. The difference between the world of nature and the world of human nature, with respect to the role of time, lies in that man, on account of his reason, pursues ends and makes choices with a view to ends:

> sic volvenda aetas commutat tempora rerum.
> quod fuit in pretio, fit nullo denique honore;
> porro aliud succedit et (e) contemptibus exit
> inque dies magis adpetitur floretque repertum
> laudibus et miro est mortalis inter honore.
> (5, 1276-80)

In addition to the blind mechanism of atoms, which, in the realm of nature, effects change, man's choice, expressed in appreciation or contempt, becomes the main factor of development. The statement of principles, in the description of man's development, ends with a rather ambiguous climax:

> usus et impigrae simul experientia mentis
> paulatim docuit pedetemptim progredientis.
> sic unum quicquid paulatim protrahit aetas
> in medium ratioque in luminis erigit oras;
> namque alid ex alio clarescere corde videbant,
> artibus ad summum donec venere cacumen.
> (5, 1452-7)

The difficulty of how to interpret "cacumen", either positively, as historical fulfilment of the development of human

nature (cf. 3, 319-22), or negatively, as natural turning point between growth and decay, indicates the difference in evaluation of time, whether nature as a whole, or human nature within nature is concerned. The fact that the description of a rather late stage in the development of man, the idyllic life (5, 1379-1415), contains word for word repetitions from the description of the epicurean attitude towards life (2, 1-61), suggests how important time and historical development of human nature are for the achievement of the highest wisdom. The wisdom, acquired over a long space of time, from primitive man to Epicurus (5, 925-1457), is shown to consist in a more and more articulate understanding of nature and human nature within nature: with the passing of time, nature appears not any more as chaotic environment, but as cosmos, as world, intelligible in causes and effects, in law and randomness. Man's experience with nature not only enables him to control and change nature "for the sake of life" (cf. 5, 195-234), but also reflects back on his understanding of himself and his relation to other men, that is, on his control and change of human nature within nature.[11]

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[11]Control and change of nature and human nature within nature is, however, not the same as the more modern "conquest of nature". Conquest of nature, as, for instance, F. Bacon envisions it, depends on the "closer and purer league between these two faculties, the experimental and the rational (such as has never yet been made)" (Nov. Org., 1, Aph. 95); "For the matter in hand is no mere felicity of speculation, but the real business and fortunes of the human race, and all power of operation. For man is but the servant and interpreter of nature: what he does and what he knows is only what he has observed of nature's order in fact or in thought;

(cf. 3, 319-22). The emphasis on "human mind" or "human reason," in addition to human action and time, as principles of change, reveals the difference between nature and human nature in their respective development: In nature, matter in motion through space effects "convenient movements," stability of growth, maturity and decay. In human nature, man, having a body, falls under the laws of all compound bodies, that is the laws of growth and decay. On the other hand, having reason, he not only has to choose the steps of his growth, but he also has to find limits, for bodily as well as spiritual needs, limits which will keep him within "convenient movements," that is

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beyond this he knows nothing and can do nothing. For the chain of causes cannot by any force be loosed or broken, nor can nature be commanded except by being obeyed. And so those twin objects, human knowledge and human power, do really meet in one; and it is from ignorance of causes that operation fails" (Nov. Org., Distrib. Op., sect. 6). "I mean it to be a history not only of nature free and at large (when she is left to her own course and does her work her own way)...but much more of nature under constraint and vexed; that is to say, when by art and the hand of man she is forced out of her natural state, and squeezed and moulded" (Nov. Org., Distrib. Op., sect. 3, cf. 1, Anh's. 1-4); "On a given body, to generate and superinduce a new nature or new natures is the work and aim of human power. Of a given nature to discover the form, the true specific difference, or nature - engendering nature, or source of emanation,...is the work and aim of human knowledge" (Nov. Org. 2, Anh.1). Though Bacon quotes Lucretius' praise of Epicurus as discoverer of the nature of things (Nov. Org., 1, Aph. 129), and though Lucretius speaks, in the account of man's development, of the cooperation of "practice and the experience of the eager mind" (5, 1241-80, and my Diss., op. cit., pp. 114-8), he would never, like Bacon, speak of man's "endeavor to establish and extend the power and dominion of the human race itself over the universe" (Nov. Org., 1, Aph. 129). Bacon's vision of the "empire of man over things" (Nov. Org., I, Aph. 129) rests on the supposition that he has "established forever a true and lawful marriage between the empirical and the rational faculty, the unkind and ill-starred divorce and separation of which has thrown into confusion all the affairs of the human family" (Nov. Org., Instant. Magna, Pref.; cf. 1, Aph. 95; cf. L. DEBUS, An introduction to the political philosophy of F. Bacon, Diss., Chicago 1957, ch. 7, The Conquest of Nature).

within the framework of human nature in its fulfilment (cf. 5, 1430-5; 2, 1-61). This wisdom to know the limits appropriate for man's nature is the prize which elevates Epicurus, the new god of culture (cf. 1, 62-79; 3, 1-30; 5, 1-90; 6, 1-42), over the old gods, Ceres, Bacchus and Hercules, who only dealt with bodily needs (5, 1-54). To know the limits appropriate for human nature means to know the limits for controlling and changing nature "for the sake of life," both human nature and nature as a whole.

The prospect of the death of our natural world (2, 1105-74; esp. 2, 1131-2), which will set an end to any historical development of human nature, whether positive or negative,[12] make man reflect on time more with respect to his own life than with respect to the life of mankind. As Lucretius claims in book three:

> illud in his rebus video firmare potesse,
> usque adeo naturarum vestigia linqui
> parvola, quae nequeat ratio depellere nobis,
> ut nihil impediat dignam dis degere vitam.
> (3, 319-22)

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[12] Scholars widely disagree about the positive or negative evaluation of man's historical development by the Epicureans. Neither the simply pessimistic (P. GIUFFRIDA, Il finale del V libro di Lucrezio, Epicurea in mem. H. Bignone, Genova 1959, 129-165; F. KLINGNER, Philosophie und Dichtkunst am Ende des 2. Buches des Lucrez, Hermes, 80, 1952, 3-31; L. ROBIN, Sur la conception épicurienne du progrès, Revue de métaphysique et morale, 23, 1916, 697-719), nor the simply optimistic (J.M. GUYAU, La morale d'Epicure et ses rapports avec les doctrines contemporaines, Paris 1927) view seems to do justice to the epicurean awareness of the problematic character of human "progress". An appreciation of both aspects, pessimistic and optimisitc (F. GIANCOTTI, L'ottimismo relativo nel "De rerum natura" di Lucrezio, Torino 1960; R. MONDOLFO, La comprensione del soggetto umano nell'antichità classica, Firenze, 1958; my Diss., op. cit., pp. 131-9), seems to come closest to the truth.

The one thing the gods are not concerned about is time and death. The position of books three and four, the books about man, between books one and two, the books about the microcosm of atoms, and books five and six, the books about the macrocosm of worlds, shows man's special position within the sum of things: being in the center between microcosm and macrocosm, he is at the same time part of the cycle of time and nature and able to detach himself from it on account of his reason. Man's mind and soul enable him to be aware of time, to be aware of the measurable aspect of nature. Aware of nature and time's role within nature, man becomes aware of death, more so than of birth, since the end to the fulfilment of human nature is more significant than the beginning of its promise. The exhortation of personified nature to overcome the fear of death, in the Finale of book three, means, in more general terms, exhortation to overcome the fear of the end of time, and, implicitly, the end of motion. The Prooemium of book two, the book about motion and rest, praised the task of the epicurean philosopher to gain rest over motion through the power of mind, enabling him to evaluate the needs of body and mind, and therefore to set limits for himself in accordance with human nature (2, 1-61). The fact that book three explains the nature of mind and soul in terms of bodies in motion through void, makes one, at least, wonder about the chances of the mind, ever to gain rest over motion and therefore to take on an attitude towards time which would render it as negligible for one single life as it appears to be for the life of the sum of things. In the Finale of book three, nature, always present and representin the unchangeable aspect of being, tries to convince man, that

time, never present, neither as whole nor in its parts, and representing the changeable aspect of appearances, is negligible as far as human life is concerned. In other words, personified nature tries to convince man that time is only an accident of matter in motion through space, or finally, an accident of nature. This means that the poetic metaphors of time: force of time, motion of time, and space of time, are to be reduced to its philosophical definition. (1, 459-63). "Time changing the nature of the whole world" and "nature altering all things" are therefore not interchangeable terms on the same level, but one, time, subsumed under the other, nature.

> mutat enim mundi naturam totius aetas
> ex alioque alius status excipere omnia debet
> nec manet ulla sui similis res: omnia migrant,
> omnia commutat natura et vertere cogit.
> namque aliud putrescit et aevo debile languet,
> porro aliud (suc) crescit et (e) contemptibus exit.
> sic igitur mundi naturam totius aetas
> mutat, et ex alio terram status excipit alter,
> quod potuit nequeat, possit quod non tulit ante.
> (5, 828-36)

Similarly to the symmetry of book two[13], where the central discussion about shape of atoms was surrounded by the discussion of motion and rest, the statement about "nature altering all things" is framed by the account of "time changing the nature of the whole world". Suspended between time, nature, and, again, time, change of things seems to be equally effected by both. The central position of "omnia commutat natura" (831 in 828-36) and the comprehensive characte

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[13]cf. p. 9 above.

of "commutat" and "omnia", compared to "mutat" and "mundi naturam totius" in "mutat enim mundi naturam totius aetas", suggest, however, that time is only the apparent, but that nature is the true cause of change.

The profound connection between nature and time is finally shown in the center of Lucretius' "De rerum natura", in the balance of the Finale of book three, the personification of nature, and the Prooemium of book four, the deification of the poet. The triumph of Prooemium four (cf. 1, 921-50) is felt even more if one is aware of its source, Euripides' Hippolytos (73-87). There, Hippolytos, fancying himself in the possession of σωφροσύνη , a possession by nature rather than by teaching[14], reveled in his dedication of a wreath of flowers to Artemis, flowers which were plucked from an inviolate meadow, watered by Aidos and visited only by the springtime bee.[15] In Lucretius' version of the image, the poet, traversing pathless fields of the Muses, loves to approach and to drink from virgin springs, and loves to pluck flowers and to seek a wreath for his own brow. The relation of Hippolytos and his goddess Artemis has been altered to the relation of Lucretius and the Muses, or, more poignantly, to the relation of the poet and Venus, the goddess over his poem "On the nature of things" (1, 21-7). The fact that the wreath, however, is

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[14]For a study of the philosophical implications of this key passage, cf. my "Nomos and Physis", An interpretation of Euripides' Hippolytos, Hermes, 101, 1973, 165-87.

[15]For a comprehensive interpretation of this passage, especially its symbolical meaning, cf. C. SEGAL, The Tragedy of the Hippolytos; The Waters of Ocean and the Untouched Meadow, HSCP, 70, 1965, 117-69.

neither for the Muses nor Venus, but for the poet himself, has something to do with his possession of a teaching, a teaching not only about Venus, but about Venus and Mars, the two powers representative of creation and destruction, which, together, form the whole of "the nature of things." The emphasis on teaching as reason for the poet's seeking the illustrious wreath is diametrically opposed to the Euripidean Hippolytos' view that virtue, that σωφροσύνη, is a gift by nature rather than an achievement by teaching. This opposition is even stronger since Lucretius' teaching claims to be about "the whole nature of things". The image of the inviolate meadow, visited by the springtime bee, is used in the Prooemium of book three with reference to Epicurus. There, the poet speaks of himself and his listeners as "bees in the flowery glades, feeding on all thy golden words", a teaching, considered worthy of eternal life (3, 9-17). Though the two passages, the one from Euripides' Hippolytos and the one from Lucretius' "De rerum natura", seem to state opposite views, the outcome of the Euripidean play proves Hippolytos' view to be at least insufficient, if not false. The strongest conclusion to be drawn from the play would be that man can have no meaningful relation with the divine, a conclusion which leads more or less directly to Lucretius' pride in "freeing the minds of men from the tight knots of religion" (4, 6-7).

In the Prooemium of book one, the beginning of the whole of "De rerum natura" as well as the beginning of its first half, Venus was hailed as goddess governing nature, while Diana (ordering the sacrifice of Iphigeneia by Agamemnon) stood as example for religion and its acts against nature (1, 62-79).

In the Prooemium of book four, the beginning of the second half of "De rerum natura", Diana, in the transformation of the passage from Euripides' Hippolytos, is rejected for Venus, and virtue, as a gift, by nature, is neglected for virtue, as an achievement, by teaching. This, in turn, means that the thought of Epicurus' teaching being worthy of eternal life (3, 13) is continued by the expectation of fame for Lucretius, who transformed the philosophical teaching into a poetic teaching, surrounding the cup of wormwood with a touch of honey.[16] The praise of teaching rather than nature as source of virtue leaves one with the question whether nature, indifferent towards man and the fulfillment of his life, is to be merely studied or whether man is supposed to "resist nature for the sake of life" (5, 206-9). The Prooemium of book two, the book about motion and rest, begins with a consideration of the sweetness of watching the restlessness of life caused by elements of nature (the shipwreck) and human

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[16] With respect to the relation between the passage of Euripides' Hippolytos (73-87) and the two occurrences of the same theme in Lucretius' "De rerum natura" (1, 921-50; 4, 1-25), I would suggest that the first half (73-81) of the Euripidean passage is treated in the first Lucretian version (1, 921-50), while the second half (82-7) of it is dealt with, when it occurs the second time (4, 1-25). The reason for this distribution can be found in the more theoretical aspect of Euripides' Hippolytus, 73-81 and Lucretius' "De rerum natura", 1, 921-50 ("dum perspicis omnem naturam rerum qua constet compta figura", 1, 949-50), and the more practical aspect of Euripides' Hippolytos, 82-7, and Lucretius' "De rerum natura", 4, 1-25 ("dum perspicis omnem naturam rerum ac perentis utilitatem", 4, 24-5). cf. my "Nomos and Physis", op. cit., 165-9; for the significance of the context for the difference of the two Lucretian passages, cf. L. STRAUSS, Notes on Lucretius, Liberalism Ancient and Modern, New York, 1968, p. 113.

nature (the battle), while oneself is at rest (2, 1-6). The height of sweetness, though, is achieved through the teaching of Epicurus (2, 7-19), through the teaching about the nature of things, which will rescue one from the restlessness of human life in all its various ways. The question whether nature is only to be contemplated or fought against for the sake of life is never openly answered in Lucretius' "De rerum natura". The fact that the teaching is likened to a cup of wormwood which is sweetened by the honey of poetry around the cup's rim veils the answer even more than the prose teaching did. The sequence of first honey and then wormwood goes through the whole of Lucretius' work. The sweet Prooemium of book one, the description of life, has its counterpart in the bitter Finale of book six, the description of death On a smaller scale, the sweet Prooemium of book one, the description of life, has its counterpart in the bitter Finale of book three, the description of death, and the sweet Prooemiu of book four, the description of the highest achievement in life, the teaching about the nature of things, has its counterpart in the bitter Finale of book six, the description of the ruin of everything worth living for, from mere life to the highest development of it. The fact that the center of the six books, the togetherness of the Finale of book three and the Prooemium of book four, lets us taste, for once, the sweet hone after the bitter wormwood, might mean that even the bitterness of death, if understood in epicurean terms, can be considered sweet. The thematic sequence of death, in the Finale of book three, and fame, in the Prooemium of book four, seems to refle

not only the necessary connection of nature and time, of that which is always the same (and refers to the past), and that which is always different (and refers to the future), but also the importance of time over and against nature. Man's awareness of time, without the awareness of nature, distorts his view of the relation of motion and rest within the sum of things. Man's awareness and evaluation of time, on the other hand, constitutes his awareness of nature, and is therefore crucial not only for his understanding of himself as part of the whole, but also of the whole itself. The fact that nature's and the poet's voice mark the center of Lucretius' work, bears out the everlasting tension between nature, encompassing all, and man, striving to encompass nature.

Appendix

Translations of the Latin quotes:

p. 1: 1, 459-63:

> Even so time exists not by itself, but from things themselves comes a feeling, what was brought to a close in time past, then what is present now, and further what is going to be hereafter. And it must be avowed that no man feels time by itself apart from the motion and quiet rest of things.

p. 4: 5, 56-8:

> I teach, by what law all things are created, and how they must needs abide by it, and how they are not strong enough to break through the powerful statutes of time.

p. 5: 1, 232-6:

> For infinite time and the day that has gone by must needs have devoured all things that are of mortal body. But whatever has been in that space and gone by time, out of which this sum of things consists and is replenished, is certainly endowed with immortal nature.

pp. 5-6: 5, 306-17:

> Again, do you not behold stones too vanquished by time, high towers falling in ruins, and rocks crumbling away, shrines and images of the gods growing weary and worn, while their sacred presence cannot prolong the boundaries of fate nor struggle against the laws of nature? Again, do we...not see stones torn up from high mountains rushing headlong, unable to brook or bear the stern strength of a limited time? For indeed they would not by suddenly torn up and fall headlong, if from time everlasting they had held out against all the torments of time without breaking.

p. 6: 5, 826-36:

> For time changes the nature of the whole world and one state after another must needs overtake all things, nor does anything abide like itself: all things change their abode, nature alters all things and constrains them to turn. For one thing rots away and grows faint and feeble with age, thereon another grows up and issues from it place of scorn. So then time changes the nature of the

whole world, and one state after another overtakes the earth, so that it cannot bear what it did, but can bear what it did not of old.

p. 7: 5, 56-8:

I teach, by what law (the law of nature) all things are created, and how they must needs abide by it, and how they are not strong enough to break through the powerful statutes of time.

p. 7: 2, 62-79:

Come now, I will unfold by what movement the creative bodies of matter beget diverse things, and break up those that are begotten, by what force they are constrained to do this, and what velocity is appointed them for moving through the mighty void: do you remember to give your mind to my words. For in very truth, matter does not cleave close-packed to itself, since we see each thing grow less, and we perceive all things flow away, as it were, in the long lapse of time, as age withdraws them from our sight: and yet the universe is seen to remain undiminished, inasmuch as all bodies that depart from anything lessen that from which they pass away, and bless with increase that to which they have come; they constrain the former to grow old and the latter again to flourish, and yet they abide not with it. Thus the sum of things is ever being replenished, and mortals live one and all by give and take. Some races wax and others wane, and in a short space the tribes of living things are changed; and like runners hand on the torch of life.

p. 8: 2, 297-302:

The bodies of the first-beginnings in the ages past moved with the same motion as now, and hereafter will be borne for ever in a similar way; such things as have been wont to come to being will be brought to birth under the same condition, will exist and grow and be strong, inasmuch as is granted to each by the bonds of nature.

p. 8: 1, 1021-31:

For in very truth, not by design did the first-beginnings of things place themselves each in their order with foreseeing mind, nor indeed did they make compact what movement each should start, but because many of them shifting in many ways throughout the world are harried and buffeted by blows from limitless time, by trying movements and unions of every kind, at last they fall into such dispositons as those,

whereby our world of things is created and holds together. And it too, preserved from harm through many a mighty cycle of years, when once it has been cast into convenient movements, brings it about that rivers replenish the greedy sea...

p. 10: 5, 436-45:

Then (at the birth of the world) a sort of fresh-formed storm, a mass gathered together of first-beginnings of every kind, whose discord was waging war and confounding inter-spaces, paths, interlacings, weights, blows, meetings, and motions, because owing to their unlike forms and various shapes, all things were unable to remain in union, as they do now, and to give and receive convenient movements.

pp. 10-11: 1, 322-8:

Lastly, whatever day and nature adds to things little by little, impelling them to grow in due proportion, the straining sight of the eye can never behold, nor again wherever things grow old through time and decay. Nor where rocks over-hang the sea, devoured by the thin salt spray, could you see what they lose in time. By bodies unseen then nature treats things.

p. 14: 1, 459-63:

Even so time exists not by itself, but from things themselves comes a feeling, what was brought to a close in time past, then what is present now, and further what is going to be hereafter. And it must be avowed that now man feels time by itself a-part from the motion and quiet rest of things.

p. 15: 2, 69-79:

We perceive all things flow away, as it were, in the long lapse of time, as age withdraws them from our sight: and yet the universe is seen to remain undiminished, inasmuch as all bodies that depart from anything, lessen that from which they pass away, and bless with increase that to which they have come; they constrain the former to grow old and the latter again to flourish, and yet they abide not with it. Thus the sum of things is ever being replenished and mortals live one and all by give and take. Some races wax and others wane, and in a short space the tribes of living things are changed, and like runners hand on the torch of life.

p. 15: 5, 195-109:

But even granting that I know not what are the first-beginnings of things, thus much at least I would dare to affirm from the very ways of heaven, and to show from many other facts, that the world was never made for us by divine power: so great are the faults wherewith it stands endowed. In the first place, of all that the sky covers in its mighty movement, a great part is possessed by greedy mountains and forests full of wild beasts, part rocks and vasty marshes hold, and the sea that keeps the shores of its lands far apart. Well nigh two parts of these lands are robbed from mortals by scorching heat, and constantly falling frost. Even the land that is left, nature would still cover with brambles by her own power, but that man's power resists for the sake of life.

p. 16: 5, 1452-5:

Practice and therewith the experience of the eager mind taught them little by little, as they went forward step by step. So, little by little, time brings out each several thing into view, and reason raises it up into the coasts of light.

p. 17: 5, 1276-80:

Thus rolling time changes the times of things. What was of value, becomes in turn of no worth; and then another thing rises up and leaves its place of scorn, and is sought more and more each day, and when found blossoms into fame, and is of wondrous honour among men.

p. 17: 5, 1452-7:

Practice and therewith the experience of the eager mind taught them little by little, as they went forward step by step. So, little by little, time brings out each several thing into view and reason raises it up into the coasts of light. For they saw one thing after another grow clear in their heart, until by their arts they reached the highest point.

p. 20: 3, 319-22:

One thing I feel able to affirm...so small are the traces of different natures left, which reason could not dispel for us, that nothing hinders us from living a life worthy of gods.

p. 22: 5, 826-36

For time changes the nature of the whole world and one state after another must needs overtake all things, nor does anything abide like itself: all things change their abode, nature alters all things and constrains them to turn. For one thing rots away and grows faint and feeble with age, thereon another grows up and issues from it place of scorn. So then time changes the nature of the whole world, and one state after another overtakes the earth, so that it cannot bear what it did, but can bear what it did not of old.