



# HENRI BERGSON



## THE PHILOSOPHY OF POETRY

The Genius of Lucretius



# **The Philosophy of Poetry**

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Henri Bergson



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## Preface

This brief volume offers an insight into the workings of the minds of two titans separated in time by a gap of more than two thousand years but bound in spirit by an intuitive grasp of the underlying pattern of evolutionary processes and by an awesome appreciation of their outward manifestations.

Lucretius (Titus Lucretius Carus, c. 98-55 B.C.), who painted a matchless portrait of man and the cosmos in his explanation of the philosophical system of Epicurus (c. 342-270 B.C.), is now ranked among the outstanding poets of all time. Milton, Tennyson, Shelley and Whitman are numbered among those who have drawn attention to the life and work of the poet whose tense, electric *De Rerum Natura* (*On the Nature of Things*) is the confession of a mind tormented by violent passions and obsessed by a longing for philosophical calm. According to Saint Jerome (c. 340-420 A.D.), Lucretius in a fit of insanity took his own life. Though one account is probably apocryphal, it is easy to conclude that Lucretius would have elected to die by suicide if he had felt at any time that he had lost forever the one thing that made life bearable, tranquility of mind.

Henri Bergson (1859-1941) is perhaps Lucretius' most articulate interpreter. Born in Paris during the year of the publication of the *Origin of Species*, he belonged to a generation strongly influenced by Darwin's theory of evolution. After graduating from the Ecole Normale, he taught at lycées in Angers, Clermont, and Paris before returning to his alma mater as a professor in 1898. He is best remembered in connection with the Collège de France, where he began lecturing in philosophy in 1900. Just before the outbreak of World War I, he lectured in the United States and in England. He was the recipient of the Nobel Prize for literature in 1928. The latter part of his life was devoted to the promotion of international harmony and understanding. During World War II, he climaxed a unique career by refusing to compromise on principle when the Vichy government, in deference to his international fame, offered to exempt him from its Jewish laws.

In his edition of *De Rerum Natura*, published in 1884 while he was teaching in the Blaise Pascal Lycée in Paris, he set down some germinal ideas that were to

be developed subsequently in better-known works. His edition of the poem (published under the title *Extraits de Lucreèce*, with a commentary, and notes, and with a study of the poetry, physics, text and language of Lucretius) deserves far greater recognition and study than it has hitherto received, both because of its intrinsic merits and because of the insight which it gives into Bergson's thinking during this early period of his life. His dissatisfaction with the materialistic orientation of his generation, implicit in his study of Lucretius, was explicitly stated in his French dissertation on the immediate data of consciousness; this dissertation, completed four years later and subsequently published in English as *Time and Free Will*, is a milestone in the history of modern philosophy. His revolt against materialism culminated in his enthralling *Creative Evolution*, the first philosophical masterpiece of the twentieth century and the work which made him almost overnight the most popular philosopher that the modern world has produced.

Bergson published his edition of *De Rerum Natura* at the early age of twenty-five. From his discussion of the diverse facets of Lucretius' genius it is clear that his deep-rooted admiration at times bordered on awe, and that this feeling was due largely to the similarity between the concepts, methodology and style brought to fruition in such works as *Creative Evolution* and those same facets of Lucretius' genius as revealed in his Latin poem. It is possible that Bergson eulogized Lucretius, not because materialism and mechanism were exerting their characteristic pull on youth, but because he glimpsed in the poet's writings a first step toward the resolution of the antinomies that were to claim his attention for years to come—determinism and choice, matter and life, body and mind. Two important concepts developed more fully in later works such as *Creative Evolution* (1907), *Mind-Energy* (1919), and *The Creative Mind* (collected essays first published in English in 1946), are worth examining in connection with Bergson's remarks about Lucretius' philosophical poem. They are his concept of *entelechy* and his concept of *intuition*.

Entelechy is distinct from both mechanism and finalism. Mechanism assumes that natural processes act blindly and are beyond the control of individual organisms; finalism assumes that these are directed toward an end by an outside force. Entelechy, however, assumes an inward determination; the function and purpose of the whole organism determines the overall design or pattern of its development.

Though Darwin's *Origin of Species* had a profound effect on Bergson's contemporaries, it failed to discredit the prevailing philosophical system; it was

simply fitted into the general scheme of mechanism. Bergson was allying himself more closely with Lamarck than with Darwin in saying that “the animal that had sufficient energy and talent to become a man was already a man.” He echoed the same thought in pointing out that behind the divergent manifestations of natural phenomena were distinct evolutionary patterns.

From the mechanistic viewpoint of Herbert Spencer, Darwin’s interpreter, accidental variations among living organisms enable some individuals to survive where others perish. Physical conditions alone determine the course of evolution. Living matter itself is but a haphazard arrangement of elements. Purposefulness, choice and direction have no part in his scheme of evolution. Lucretius, too, referred to the blind, inexorable laws of nature; but he had also glimpsed with a poet’s eye the ultimate beauty of nature’s creations. Bergson’s remarks show that he conceived of nature, not as being forever held in check by mechanical repetition, but as forever creating something new. It is also significant that in this early work he looked upon the evolution of man as a “struggle that involved both his intelligence and his will.”

Darwin’s theory of evolution pointed to the conclusion that flux (or becoming), not being, is the essence of reality. Though Bergson’s ideas on the subject were not elaborated until years later, his study of Lucretius clearly indicates the direction his thought was to take. In it he referred, for instance, to the “noble anxieties” of man. Man’s anxiety is a product of his freedom; the ability to go through the process of choosing, even if the final choice in retrospect seems fixed by external circumstances, sets man above the beast; it causes anxiety, for it is creation, and creation is toil.

That Lucretius could make his discoveries despite his shortcomings as a physicist (for instance, his ignorance of scientific method) obviously appealed to Bergson. Characteristically, he refrained from making any attempt to refute Lucretius’ system; to him philosophy was a deliberate attempt to grasp the immediate data of consciousness; many thinkers had contributed a modicum of truth to the cumulative store of knowledge; the important thing was to recognize and use the contribution of each. One of the Latin poet’s contributions was his concept of perpetual evolution in accordance with natural laws, and his contribution was made possible only by his ability to discern behind the manifold and multidirectional manifestations of nature the flux which is the essence of reality.

In discussing Lucretius’ concept of evolution, Bergson called attention to the poet’s ability to see beyond the “fleeting, transitional variations” of nature; he

also used the word intuitive in characterizing the poet. As developed in later works, particularly in *Creative Evolution*, the notion of intuition (Latin *intueor* “looking into”) was posited as the best short-cut to the immediate data of consciousness, the perpetual flow of things. Possibly the paramount importance attached to intuition in the thinking of both men played a part in Bergson’s decision to prepare an edition of *De Rerum Natura*.

But throughout the volume there are clear indications that both philosophers understood the importance of both the intellectual side of reality and the intuitive side. Bergson had unstinted praise for the Latin genius who was capable of grasping both the static and the evolutionary character of nature. Later, of course, Bergson incurred bitter criticism as a result of the interpretation given to his views on intuition and its ascendancy over reflection. Here, however, he praised the poet for his “ability to grasp outright the two-sided character of things.” And from his writings as a whole, it would seem that to him the true artist is able to grasp and communicate the evolutionary pattern of things—their flux or becoming—while the scientist is able to grasp their discrete, static manifestations.

Bergson’s study of *De Rerum Natura* also provides an insight into other facets of his genius. The most obvious of the concepts adumbrated here and elaborated in later works include: place (in his Latin dissertation on Aristotle’s notion of place, *Quid Aristoteles de loco senserit*, 1889); freedom of choice (in his French dissertation and in *Matter and Memory*, 1896); perception (in *The Perception of Change*, 1911, and in *Dreams*, 1911); intuition (in *Introduction to Metaphysics*, 1903); and morality and immorality (in *The Two Sources of Morality*, 1932). In connection with the last work, it is well to remember the importance attached to sympathy in Bergson’s remarks about the role played by the same sentiment in *De Rerum Natura*.

In the Latin poem Bergson found a stimulating presentation of crucial issues that were to be the focal points of several successive volumes in which he proved to be the most persuasive champion of vitalism and the most powerful opponent of materialism of the twentieth century. Readers familiar with his persuasive style, on noting his admiration for the Latin poet’s style, will find that Bergson and Lucretius had certain characteristics in common: imagery, exaggeration, lucidity and, above all, the effective use of metaphor and analogy. Readers familiar with the prodigious breadth of his scholarship in other fields will not be disappointed by his handling of classical literature in this study.

It will be obvious to even the casual reader that Bergson had more in common

with Lucretius than an inquiring mind and a persuasive style. As suggested earlier, both stressed the procreative urge of the universe (later envisioned as a progressive extension of the area of freedom of action and called *élan vital*) and the importance of intuition in grasping directly the eternal flow of reality. In addition, both the pre-Christian philosophical poet and the post-Darwin poetic philosopher had vaulting minds capable of assimilating the best of contemporary thought and of contributing to the cumulative store of human knowledge another modicum of truth. Both had in equal parts the imagery of the poet and the sense of form of the geometrician. Finally, both had an awesome appreciation of the eternal laws of nature and a deep sympathy for and an abiding love of mankind.

In this translation I have attempted to preserve the meaning and style of Bergson's early study of Lucretius. Originally prepared as an introduction to an annotated edition of the Latin text of *De Rerum Natura*, the French commentary was intended for classroom use. It seemed fitting therefore to omit or to recast some of the material included in the "Foreword" and in the "Summary" of the French volume and to combine the significant parts of each in the present "Introduction." A section on the language of Lucretius (archaic Latin forms and abbreviations) has also been omitted, along with the annotated Latin text. For the sake of greater continuity, the order of the different sections (all included under the "Introduction" in the French edition) has been changed. Despite all that, if my aim has been achieved, the reputation of Henri Bergson will not suffer in this the one hundredth anniversary of his birth.

Wade Baskin



## Introduction

In order to suggest the scope of Lucretius' genius, I shall treat the poem as a whole. To select only the descriptive passages of *On the Nature of Things*, as editors frequently do, is to give a mistaken impression of its author. The poet's most gripping pictures—the life of primitive man, the effects of lightning, the plague of Athens—are meant solely to make us understand and accept some great philosophical principle. Taken out of context, his lines are less vivid; though assuredly beautiful even then, they lack the oratorical power that is the mainspring of their originality. I shall not attempt to criticize Lucretius' ideas except in the case of glaring errors. It is easy to refute any philosophical system; the important thing is to understand the system.

To free the human soul, beset by superstitions, Lucretius promises to show that everything in nature can be explained without recourse to the gods. He does not gloss over the difficulty of his task; he intends to begin with the driest part and to outline the basic principles of Epicurean physics.

As Lucretius writes, Rome is torn by civil strife. Venus, who exerts some influence on Mars, may be able to secure for him the peace required for philosophical studies. The invocation is followed by the introduction proper. The poet writes to restore calm to human hearts troubled by vain superstitions. Religion, guilty of many crimes, has kept mankind in constant dread of death.

Nothing springs from nothing, and nothing is ever destroyed. This basic principle was first brought to light by the genius of Democritus. To call in the supernatural is to admit that something can be created out of nothing. Against this, it is possible to explain things scientifically by showing that a particular phenomenon is nothing more than the transformation undergone by one or more previous phenomena. Lucretius' explanation is remarkable: What proves that nothing springs from nothing is that anything, to be created, requires a specific germ, set of conditions, and time. And since a specific force is necessary for the destruction of a particular body, destruction is nothing more than the separation of the parts of that body. These parts are used in turn in creating new bodies. If nothing springs from nothing and nothing is ever destroyed, matter must be

composed of lasting, indestructible elements—the invisible particles which Leucippus and Democritus called *atoms*. The common people refuse to believe in atoms because they understand only what they can see or touch. But many things are beyond the senses, yet very real. Lucretius' theory of atoms, one of the most beautiful creations of antiquity, is today accepted as the best explanation of the basic laws of chemistry, particularly of Proust's law of definite proportions and Dalton's law of multiple proportions.

If bodies are made up of atoms and if atoms are distinct, then bodies must be separated by intervals; the existence of atoms requires the existence of void. Nothing at all exists other than atoms and void. A third element is inconceivable. If anything can be handled, it is a body composed of atoms; if it can not be touched, it is void. The things which seem to us to exist without being either matter or void (time, the qualities of bodies, etc.) can be reduced in the last analysis to simple properties of atoms or combinations of atoms. Here Lucretius' arguments are childish; he accepts without proof the notion that whatever is not tangible has no independent existence, that is, that all reality is material.

Having outlined the basic principles of his doctrine, Lucretius completes his proof by refuting other philosophical theories, particularly those of Heraclitus, Empedocles and Anaxagoras. Astounded by his own facility for handling such arid discussions, he naively gives expression to his joy and pride.

Each of his six books of the poem opens with the development of some remark about philosophy in general or about the particular aim of Lucretius. Book II begins with a magnificent eulogy of philosophy. In all probability it was inspired by Epicurus, who by relating virtue to the search for pleasure, made pleasure itself consist of peace of mind, the privilege of the sage.

In Book I Lucretius enumerated the elements of which things are composed. Now he explains the movement and properties that enable the elements to draw together and form inanimate and animate things. The movement of atoms is eternal. Launched across the void, they move about, either because of their own weight or because of their colliding with other atoms, until chance brings them together. Some of them stick to others and form the hardest bodies. Other more mobile atoms are separated by more space and constitute the less dense bodies, air and light. Finally, some join no cluster but move aimlessly in space, like the particles of dust in a ray of sunlight that shoots across a dark room.

Atoms move at an infinite speed. By virtue of their weight, they tend downward. Allowed to move naturally, they would fall vertically at a uniform

speed and would never meet. Epicurus therefore attributed to them occasional slight variations; this imperceptible and unpredictable trait he called *clinamen*. But Epicurus would certainly not have invented *clinamen* if he had not felt the need for establishing the freedom of man. The soul to him was a mere collocation of atoms; if subjected forever to an invariable and inexorable movement, it could have no freedom; thanks to *clinamen*, however, atoms are endowed with genuine initiative and our souls with some sort of freedom.

In the whole universe no two combinations of atoms are absolutely identical; therefore no two beings are exactly alike. Each new combination of atoms creates a new body or a new quality. If the earth is fruitful, producing bodies of every class, this is because the earth contains a great number of diverse atoms. This world is a hapless combination of atoms—and not necessarily the only one. Everything in the universe is explained by combinations of atoms through a mechanical cause-and-effect sequence. Gods, though they must exist since we have an idea of them, do not interfere in any way with the things of this world, and it would be childish to fear them. All living things at first grow, then disappear. The same is true of the earth, our common mother. Having produced all living species, the earth has already begun to show signs of exhaustion; one day it will fall into dust. Lucretius, like Epicurus, reasons frequently through analogy. Here he compares the earth to a living being. If heat is the mainspring of life, as some physiologists hold, and if it is true that the earth is constantly cooling off, then Lucretius is almost right.

In Books I and II the poet showed that the gods do not interfere in the universe. Before coming back to this theme, he intends to prove another great truth brought to light by Epicurus: The gods are as indifferent about the future of our souls as they are about the nature of things. Because we fear death and hell, we prefer life to all else, even honor. By freeing us from this fear, Epicurus made us better and happier. To prove that the soul is nothing more than matter, Lucretius draws upon the relation between the soul and the body under different conditions: age, sickness, drunkenness, and epilepsy. To prove that the soul is subject to death, he shows that it is made up of subtle atoms scattered through the body and is therefore as material as the body itself. Two things do not interact unless they touch, and they touch only if they are material. Since the soul is material and decays along with the body that contains it, why fear death? Death is the end of everything; if it takes away our worldly goods, it also spares us the regrets which we might feel about them. Lucretius was unable to destroy belief in the immortality of the soul, for this belief is much stronger than his

philosophical arguments. He did, however, have remarkable insight into one of the sources of this belief, the instinctive tendency which every living being has to perpetuate itself indefinitely in time.

There is no such thing as hell or an evil spirit. The myths of Sisyphus, Cerberus, etc. are all attempts to represent the human heart, tormented during this life by vain terrors or guilty passions of which it is the dupe or the victim. Book III concludes on a melancholy note. Life is nothing more than constant movement that leads nowhere, than desire that is never fulfilled.

In Book IV the poet describes the origin of ideas just as he has already described and will again describe the origin of things. Each object sends out images or *simulacres* that strike our senses. These particles are extremely minute; they come from everywhere and move with inconceivable speed. On striking our eyes, they create optical perceptions which are always true since they are identical images of things. The senses give rise to illusions, not because they deceive us, but because we interpret falsely the data which they transmit. The idea of a body is nothing more than a miniature version of the body itself.

The perceptions of dreams are due to the same causes as those of waking moments. Some images are lighter and smaller than others; they strike our minds when we are asleep. Those most nearly in conformity with our habitual preoccupations are the ones which the imagination is most likely to adopt, interpret, and round out to its own satisfaction. The illusions of dreams bring Lucretius quite naturally to the illusions of love.

Four of the six books that make up *De Rerum Natura* begin with a eulogy of Epicurus. But Lucretius never repeats himself. In Book I he praised the religious skepticism of his teacher; in Book III, his knowledge; and in Book V, his ethics. In Book VI he will show that the philosopher who gave us directions for our conduct in life ranks with the great inventors and heroes numbered among the gods. He will also relate the origin of the universe and mankind. The universe is not the work of the gods; it was not made for us; it was shaped independently by the haphazard coming together of atoms which, after trying all other combinations, were finally forced to join together in their present form. He considers the main parts of the universe separately; each part, since it waxes and wanes, is alterable. It began and it will end. Other parts wage war against it, with the result that it will probably succumb. The universe, whose parts are all destructible, will in turn perish. For Lucretius, death is change, and when its

atoms regroup themselves and form a new combination, even though its elements remain, the universe will die.

The problem of the origin of life has baffled natural science and philosophy until the present day and is probably beyond the cognizance of either. We can not praise too highly the great intellectual effort through which Lucretius managed to glimpse one of the most original hypotheses of modern science. He saw clearly from the outset that this problem embraces two separate questions: (1) the origin of the first living beings; and (2) the particular conformation and marvelous adaptation of their organs to their needs. He also saw that the first question does not lend itself to scientific explanation. Darwin, the boldest of modern naturalists, gave up the attempt to explain the appearance of the first living organisms. Lucretius fell back on a myth; like the poets, he has living beings spring from the earth, the mother of all things. On the second point, Lucretius' answer is in some respects like Darwin's. Of a multitude of living organisms that spring up haphazardly, the only ones to survive are those capable of providing for their needs and adapting themselves to their environment. In these beautiful descriptive passages Lucretius' imagination is given full reign. Latin literature offers nothing superior to the last half of Book V.

The birth of living beings in general and of men in particular was due solely to chance; naturally, mankind had a hard time of it at the very beginning, though poets, thinking that the gods protected mankind, assigned the golden age to the origin of the human species. As nothing more than an animal—weaker even than the other animals—he evolved slowly, painfully, through a sustained struggle that involved both his intelligence and his will, and finally he achieved a social order and a civilization. But in spite of the beauty of his description, Lucretius can not be forgiven for failing to recognize our ethical superiority. The more humble our origin, the more praise we deserve for becoming what we are. And the animal that had sufficient energy and talent to become a man was already a man.

Having explained the origin of man, Lucretius shows how individuals banded together to form families, and how families formed nations. The state resulted from a contract through which the first men bound themselves to provide for the infirm and for women and children. Speech provided a solid link; Lucretius assumes that in the beginning men quite naturally applied the proper sounds to different objects. Towns were first built by kings to serve as places of refuge. Physical endowments, strength, or beauty determined the individual's rank in the state. Later physical strength was replaced by wealth, and the desire for wealth

and honor gave rise to struggles of every type, causing kings to fall. Power was then exercised by the masses; each individual aspired to the throne; everywhere trouble and confusion reigned. To re-establish order, men appointed magistrates and drew up laws; this accounts for the feelings that characterize the social order—fear of punishment and remorse.

Finally, Lucretius explains why men believe in gods even though the gods do not interfere in this world. A man may overtax his imagination, when asleep as well as when awake, with the result that it in turn conceives of beings endowed with extraordinary strength—gods. The spectacle of great catastrophes—lightning and storms—fills the hearts of men with religious terror. This accounts for superstitious practices and for false piety.

Athens not only invented agriculture and laws; it also rendered mankind another service when it produced Epicurus. He understood that man has, materially, everything that he needs to live and even more; that man nevertheless brings suffering upon himself because he is enslaved by desire, passion, superstition and fear; and that man's happiness depends not on external things but on his state of mind.

Lucretius indicates that the purpose of his last book is to prove that certain phenomena that seem extraordinary, strike the imagination of man, and pass for the wrath of the gods—lightning, storms, earthquakes—actually result from natural causes. Lightning is explained by natural causes and is not to be interpreted as a divine warning. The Etruscans had introduced the Romans to a number of ridiculous superstitions on this point. Lucretius therefore devotes considerable energy to overcoming these superstitions. He also explains the causes of other physical phenomena that spread terror or astonishment among men—waterspouts and whirlpools, clouds, rain, rainbows, earthquakes, volcanoes, the flooding of the Nile, the attraction of magnets, etc. He ends with a frightening picture of epidemics, in particular the most disastrous of all, the plague of Athens.

Having found natural causes for everything else that strikes man's imagination, Lucretius ends with an explanation of the plague. Though his explanation is purely physical, he paints an unforgettable picture. It is obvious that he models his discussion of the plague of Athens on the frightening description left by Thucydides. His proposed explanation is worth noting: germs, scattered throughout the atmosphere, develop inside the human body.

## The Text of *De Rerum Natura*

Lucretius' poem is in all probability a complete work. The poet lists at the beginning of the first book (I, 127) the main subjects to be dealt with: the nature of the soul, the origin of the beliefs in spirits, celestial phenomena, first principles of natural phenomena, the natural production of things, etc., and each of these subjects is actually developed in the poem as it has come down to us. Besides that, Lucretius states formally at the beginning of his sixth book that this book is to be the last.

Yet it is obvious that Lucretius did not give his poem the finishing touches. Only the first book has the arguments methodically arranged. Since the poet refers repeatedly to the great importance which he attaches to a systematic arrangement of different parts and to the methodical grouping of proofs, it would seem that if he had had sufficient time at his disposal, he would have transposed whole paragraphs, intercalated transitions, and eliminated repetitions.

The poem was not published until after the poet's death. According to St. Jerome, Cicero was the one who edited it. It must be noted, however, that there is nothing in Cicero's writings to confirm St. Jerome's statement; in his correspondence he is silent on this point, and it is common knowledge that he was not accustomed to keep silent about his accomplishments. It is possible, as some hold, that St. Jerome was alluding, not to Cicero the orator, but to his brother Quintus. Still, St. Jerome used the name Cicero only to designate the orator. We must conclude that Lucretius' editor is unknown, and that even though the editor may have been Cicero, as tradition has it, nothing confirms this assumption.

It is hard to determine whether Lucretius' poem was fully appreciated at the outset. Cicero treated it with indifference. But we do know for a fact that the great writers of the Augustan age knew *De Rerum Natura* and constantly imitated Lucretius without naming him. Virgil was probably afraid that he would displease Augustus if he uttered the name of the old poet; only once did he risk a timid allusion:

Felix qui potuit rerum cognoscere causas,  
Atque metus omnes et inexorabile fatum  
Subjecit pedibus, strepitumque Acheruntis avari!

Against that, a collection of all the expressions and hemistiches which Virgil borrowed from Lucretius would fill a volume. Whenever an idea previously expressed by Lucretius entered his mind, Virgil almost invariably used the same words. Alluding to those involved in civil wars:

... Gaudent in tristi funere fratris (III, 72),

Virgil could not keep from writing:

... Gaudent perfusi sanguine fratrum (*Georgics*, II, 510).

The words of Lucretius:

Primum Aurora novo cum spargit lumine terras ... (II, 144)

were repeated by Virgil:

Et jam prima novo spargebat lumine terras ... Aurora ... (*Aeneid* IX, 459).

Not only are there many imitations of Lucretius in Virgil's works; there are also passages suggested by Lucretius. Virgil would not have written:

... pueroque puer dilectus Iulo (*Aeneid* V, 269)

if Lucretius had not said:

Cum pueri circum puerum pernixe chorea ... (II, 635).

More striking still is the manner in which Virgil repeatedly imitated Lucretius unsuspectingly. In one passage Lucretius states that the trees deck themselves out with branches because of rain:

... Ramique virescunt



Arboribus; crescunt ipsae, fetuque gravantur (I, 253.)

Virgil, who had Gallus express a different idea, placed the word *arboribus* at the beginning of a line. Immediately the word *crescunt* came to mind, though he was perhaps unaware of the reason, and the rest of the line followed the pattern set by Lucretius:

Arboribus; crescent illae, crescetis amores (*Eclogues* X, 51).

Many of his lines reproduce the rhythm and movement of lines from *De Rerum Natura*, yet fail to include the same words. Such imitations, unconscious perhaps, show how assiduously Virgil studied Lucretius and how completely he assimilated his poem. The ancients were aware of this. Aulu-Gelle stated: "We know for a fact that Virgil reproduced not only a host of expressions but almost whole passages written by Lucretius."

The writings of Ovid contain an equal number of imitations. But Ovid at least had the courage to state his opinion openly: "The sublime verses of Lucretius will live on until the end of the world." He borrowed many ideas from Lucretius but usually expressed them less forcibly. The beautiful lines from Lucretius:

Despicere unde queas alios, passimque videre Errare, atque viam  
palantes quaerere vitae ... (II, 9)

were adapted by Ovid:

Palantesque homines passim ac rationis egentes Despectare procul ...  
(*Metamorphoses* XV, 150).

He even imitated the same passage from Lucretius three or four times (I, 311); the movement and rhythm of the line:

Silva domus fuerat, cibus herba, cubilia frondes (*Art of Love* II, 475)

clearly echoes Lucretius' lines:

Terra cibum pueris, vestem vapor, herba cublie Praebeat ... (V, 813).

Moreover, a thorough study of Virgil's and Ovid's imitations would bring to

light an extraordinary fact. Virgil and Ovid often—generally, in fact—borrow the same expressions and copy the same passages from Lucretius. There is only one explanation, I believe, for these coincidences. During the Augustan age Lucretius’ poem must have been studied to such an extent—it must have become such a “classic”—that a number of its expressions had become proverbial. When Latin poetry was stressed in our schools, certain final lines from Virgil, for instance, appeared frequently in students’ papers; too well known to allow plagiarism, they were nevertheless adaptable enough to tempt students to inject them into their papers. That is how certain expressions from *De Rerum Natura* had probably come to be looked upon as public property. Consider only the obvious examples. Lucretius depicts youth:

Turn demum puero illi aevo florente juvenas Occipit, et molli vestit  
lanugine malas (V, 885).

Henceforth, the last words of the second line, *lanugine malas*, were to find a place in many descriptions of youth. Ovid repeated the words three times. Immediately there comes to mind Virgil’s line:

... flaventem prima lanugine malas (*Aeneid* X, 324).

In speaking of a mother’s grief, Lucretius says:

Aeternumque daret matri sub pectore volnus (II, 638).

Three of Virgil’s lines and one of Ovid’s have the same ending.

Lucretius ends his eulogy of Empedocles in this way:

Ut vix humana videatur stripe creatus (I, 733).

Virgil and Ovid both repeated the last two words. In a remarkable passage of Book III (893), Lucretius says:

Nec dulces occurrent oscula nati Praeripere. ...

One line from Virgil’s *Georgics* (II, 523) ends the same way:

... Dulces pendent circum oscula nati. ...

And Ovid wrote *dedit oscula nato, dedit oscula natae*, etc. The examples could be multiplied.

Horace imitated Lucretius less frequently. Epicurean in a wholly different sense, he was simply unable to appreciate the virile simplicity of the old poet. But even Horace chanced to reproduce locutions which had in all probability become proverbial. In Book I of his *Satires*, for example, the allusion is supposedly known to the reader:

... Namque deos didici securum agere aevum (5, 101),

for Lucretius had actually written:

Nam bene qui didicere deos securum agere aevum (VI, 58).

The foregoing citations, which could be multiplied indefinitely, suggest the preponderant influence which Lucretius had on classical literature. It is clear to any student of Latin poetry of the Augustan age that he was quoted by every writer. But by the end of the brilliant reign of Augustus, Lucretius' reputation had already begun to suffer. Overemphasis on form and detail made its appearance in literature. Lucretius was no longer read, for his poem is too unpretentious, too comprehensive. It was relegated to a place among routine treatises on physics. Vitruvius mentioned Lucretius in his writings but seemed to look upon him as little more than a physicist. A few years later Velleius Paterculus linked his name with Varron's. The same comparison was drawn by Quintilian who, in a different passage, called Lucretius *difficilis*. But in all probability Quintilian, to judge by his vague expressions, had not read *De Rerum Natura* but was merely expressing the commonly-held opinion of his time when he called Lucretius difficult. This is not in the least surprising. During periods of decadence literature and science follow uncharted paths; whatever expresses a profound thought is labeled obscure and clumsy. Furthermore, Lucretius expected to be misjudged:

... Quoniam haec ratio plerumque videtur Tristior esse quibus non est tractata.

It is possible that Stace had a better understanding and appreciation of Lucretius, but he used expressions which are decidedly vague. Lucretius' only readers at the end of the first century A.D. were a few persistent but not very enlightened

admirers of classical literature. "Some people," said Aper disdainfully, "prefer Lucilius to Horace and Lucretius to Virgil." From that time on, Lucretius was almost entirely neglected. In the great battle waged between Christianity and waning paganism, Christians and pagans agreed on leaving him aside; pagans could not cite as one of their authorities the poet who had spoken out so violently against their gods; Christians vaguely sensed that there was something offensive to Christianity itself in his arguments, for he had excluded the supernatural from the universe and had denied divine intervention in human affairs.

For these reasons Lucretius' poem, which had been widely read and admired during the reign of Augustus, gradually fell into oblivion. And since *De Rerum Natura* was not designed for use in schools, the number of manuscripts in existence after the Augustan age was small. At the end of the eighth century, there was in all probability but one extant manuscript; it was written in capital letters, and the words were run together. That manuscript, which was much closer to the original version than any we have today, was lost, but not before three copies, dating from the ninth century, had been made. Of the three copies, one has probably been preserved until the present; it is one of two manuscripts in the library of Leyden (*Leidensis I* or *Oblongus*), the best of the extant manuscripts. A second copy was the source of the second manuscript preserved in the same library. Finally, a third copy was found in Germany by Pogge and returned to Italy; though lost subsequently, it was the source of the Italian manuscripts (*Italici*); eight of these are in the Laurentian library in Florence, six are in the Vatican, and one is at Cambridge. Thus most of the different manuscripts date from the Renaissance; the two Leyden manuscripts and the lost manuscript copied in the *Italici* go back to the Middle Ages.

The three older manuscripts were not studied until the Renaissance. During the Middle Ages no one knew anything about Lucretius. *De Rerum Natura* is not mentioned in Italian literature of the Middle Ages.

In France, Honoré d'Autun included a citation from Lucretius in a twelfth-century work, but he had borrowed it from his fifth-century predecessor, Priscian.

The Renaissance rescued Lucretius from oblivion. Around 1417 Pogge, traveling in Germany, discovered a manuscript of *De Rerum Natura* in a monastery and brought it back to Italy. Landin congratulated him for bringing Lucretius back to his homeland.

Lucretius actually had been brought back to the Romans, but in what

condition! The copyists of the Middle Ages, who understood very little of Epicurus' philosophy, had completely distorted his thought; and the first edition of the text of the poem, that of Fernandus de Brescia (1473), was almost unintelligible. In 1500 there appeared an Aldine edition with a commentary by Avancius of Verona. In 1512 Justine issued a new edition incorporating the notes left by Marullus, the famous scholar, poet and soldier.

But it was not until the appearance of Lambin's edition (1564) that Lucretius' work was understood and appreciated to any great extent. Imbued with a deep respect for Lucretius, Lambin set out to restore the text distorted by the copyists of the Middle Ages and Renaissance. His corrections, some eight hundred if we take his word for it, are excellent in view of the fact that he worked during a period when textual criticism was still an art rather than a science, and his explanatory commentary is still today our basic work on the interpretation of Lucretius.

Unfortunately, Lucretius was wholly neglected during the century that followed, either because scholars were discouraged by Lambin's masterly work or because they found the atomic theory unpalatable—or perhaps for both reasons. He did of course find a disciple in Gassendi and perhaps an admirer in Molière, who is said to have undertaken the translation of *De Rerum Natura*. Lambin's work is superior by far to the works of Bentley and Creech (1695).

The eighteenth century applauded Lucretius' materialism, yet perhaps without understanding the nobility and beauty of his poetry. When Cardinal Polignac attempted to refute atheism in Latin verse, he saw fit to give his poem the imposing title of *Anti-Lucretius*. Only one eighteenth-century edition of Lucretius is worth citing, and that is the Wakefield edition (1796).

The nineteenth century inherited the task of restoring Lucretius' text insofar as possible and of encouraging men once again to look upon the author with the admiration and esteem that had been denied him since the closing years of the Augustan age. There were two reasons for the revival of interest in Lucretius. First, attention was drawn to the man who originally had an insight into modern scientific hypotheses; people later discovered that he was a great poet. Second, Lucretius' text was restored by one of the most remarkable scholars of our century, Lachmann. For five years (1835-1840) this philologist, well versed in Latin poetry, devoted himself to the study of Lucretius; he corrected the traditional text systematically; he proved that all our manuscripts derive from a single archetype; thanks to his astounding brilliance, he was able to deduce logically the contents of the original manuscript. His corrections are sometimes

rash; often they show a lack of good taste; but he opened a new vista in the criticism of Lucretius and at the same time laid the foundation for the study of Old Latin. Bernays (1852) carried on Lachmann's work. Finally, in 1864, Munro published his outstanding edition of Lucretius' poem; his work, though not so daring as Lachmann's, also contains a wealth of original ideas.

## The Poetry of Lucretius

The life of Titus Lucretius Carus is hardly known other than through a controversial passage found in the writings of St. Jerome. The poet was probably born in Italy about 99 or 98 B.C.; he may have been a member of the nobility. According to St. Jerome, he swallowed a philter and became insane; he wrote the six books that make up *De Rerum Natura* between his attacks of insanity; he killed himself around the year 55. This lugubrious account has all the earmarks of a novel. In the days of St. Jerome people liked to imagine that atheists were punished in this way by the gods whom they had angered. It is more likely that Lucretius lived as a philosopher, ignored by the world and practicing the maxim of his mentor, Epicurus: "Hide your life." In accordance with another precept of Epicurus, he seems to have had friends. To one of them, Memmius, he dedicated his poem.

Older writers tell us nothing about the poet's character, personality, or manner of living. They imitated him and copied him, as we shall see, but they said little about him. It would seem that Lucretius, the enemy of religion, was a dangerous friend to have after the republic fell and the emperors restored paganism. Our knowledge is restricted to what we know of the poet through his work; it is safe to assume that the sincerity of his work cannot be challenged.

A pervasive melancholy is the most striking characteristic of Lucretius' work. *De Rerum Natura* is sad and disheartening. What is the point of living? Life is monotonous; it is a treadmill that leads nowhere, a desire that never finds fulfillment. Pleasures are deceptive, no joy is untainted; the bitterness that stifles us when we are surrounded by perfumes and flowers reeks from the very seat of our desires. Observe, for instance, how a child cries out at birth; he fills the air with his mournful wailing, and this is as it should be, for he must endure many ills during his life. Later, as a grown man, he will work, busy himself, make superhuman attempts to merit riches and honors; yet all his striving will be in vain. He would live more happily and tranquilly in the fields where his soul would be less troubled and where he would be closer to nature. Does this mean that happiness has sought refuge in the country and that the man who fearlessly

and serenely cultivates his land is happy? After letting us be deluded for an instant, the poet brushes away the illusion. Unfortunately, fate is perfidious, the land gluttonous. The plowman wears out his tools and wastes his strength, but the land yields less than the bare minimum required; the vineyard-keeper plants his vines, but the sun withers them; both sigh and shake their heads but fail to see that the earth is tired of producing and that everything in this world grows old, tires and soon will rot away. And so we spend the best part of our lives in pursuing vain honors or in cultivating land that is barren and indifferent to our toil. Then comes senescence and with it the childish fear of death. The dotard is tortured by his own visions of death. All hope, all joy has disappeared; no longer will his family rush out to welcome him; no longer will his wife and children compete for his embraces. He does not see that death is the end of everything, that even as it deprives him of the comforts of life, it delivers him from his need of them and from the sufferings that invariably accompany them. Since everything in this life is wretched, our great consoling thought is that everything will end for us when our lives end. That is the conviction of the sage and the conclusion of the philosopher. Knowledge serves mainly to show us that we count for practically nothing in the universe where gods are not concerned with us, where we are but a fortuitous combination of elements, and where we decay just as other bodies do. And the sage, acquainted and imbued with that great truth, calmly awaits a death which, as he well knows, will reduce him to nothingness; he possesses supreme knowledge and at the same time savors the sweetest joys that man is privileged to experience.

What is the source of the poet's melancholy? In our search for an answer we must probe deeply into his soul.

We can be certain that the spectacle of civil strife had its effect on Lucretius. At an early age he witnessed the bloody struggles that stemmed from the rivalry between Marius and Sylla. That was but a prelude to the violent upheavals that were to darken the Roman republic. The poet could foresee them, and as a result he suffered cruelly. His first lines are a prayer to Venus, begging her to have her Mars bring about peace and harmony:

... *Suaves ex ore loquellas*

*Funde, petens placidam Romanis, incluta, pacem.*

Later he will show the vanity of glory and honors. What are power and wealth compared to philosophy and the peace of mind that it affords? He hurls a



challenge at those guilty of ambition and intrigue: “Let them sweat and bleed in the narrow road where their ambition writhes; envy, like lightning, is more likely to strike in high places.” And Lucretius, joining example to precept, stood apart from public affairs, though his heritage weighed against this; for while there is nothing to prove that he belonged to the *gens Lucretia*, the familiarity with which he treats Memmius indicates that fate had not put a very large gap between the two friends.

The spectacle of civil wars undoubtedly left a dark imprint on Lucretius’ mind. But we must hasten to add that the first source of his melancholy and the source of the theme of his poem must be sought elsewhere.

If the spectacle of public calamities likely to dishearten a conscientious man had caused him to ponder and to write, Lucretius would have looked on knowledge as an expedient and on philosophy as nothing more than a means of seeking consolation. It was obviously in such a spirit that Cicero began most of his philosophical treatises. We find no trace of this spirit in *De Rerum Natura*. What made Lucretius a philosopher was not disgust over intrigue or ambition; his only complaint is that these things turn minds away from philosophy. Knowledge is more than a refuge or a consolation in times of strife; it is the object of life itself; and strife, wars and public disasters are ills only because they turn attention away from the only noble preoccupations worthy of the mind. As we study each passage, we see that behind Lucretius’ thought is always that conviction. At the beginning of Book I the poet asks Venus for peace and harmony, but at the end of his invocation he points out the reason for his prayer: “Surrounded by the ills of the fatherland, the poet would be unable to pursue his work in peace; Memmius could not devote himself wholly to philosophy.” At the beginning of Book II he takes pity on the ambitious, eager to obtain honors and wealth, but he does this to emphasize the happiness of the sage who through philosophy has risen above competition. Finally, we should note that he returns in Book V to the picture of the ambitious, not to decry the evil of their actions but to bewail the evils which their actions spawn. And he adds: “What I am saying here applies to the present and to the future as well as to the past.” There is no indignation and no trace of anger—only deep pity for men who fail to see wherein happiness lies and who therefore unknowingly do themselves great harm. His is not the language of a man who suffers deeply because of the ills of the fatherland and who bewails the degeneracy of its people.

What the poet thought and felt is revealed, not in the history of the events that he witnessed, but in his own writings.

Lucretius had an abiding love for nature. His poem shows that he was a patient, attentive observer—in the country, at the seashore, atop mountains. And as he observed the poetic and lovable side of things, he was struck and enlightened by a great truth: behind the smiling, picturesque face of nature and beyond the infinitely diverse phenomena that constantly change, there are pre-established, unchangeable laws which work uniformly and constantly and which, individually, produce predetermined effects. Nothing is fortuitous, and there is no place for nonconformity; everywhere there are collective or compensatory forces, mechanically linked causes and effects. A number of invariable elements have existed throughout eternity; the inexorable laws of nature determine how they combine and separate; these laws are rigidly prescribed and adhered to. We perceive the outer, picturesque side of phenomena; we think that their order and substitution are whimsical; but investigation and meditation reveal that their combinations and separations are mathematically predictable, for they are always the inevitable consequence of what has preceded. This is the dominant theme of the poem. Nowhere is it explicitly formulated, but the whole poem is nothing more than the development of that theme. Nature is destined forever to apply the same laws in the same way; its pattern is set forth in a *foedus*, and the contract is forever binding (V, 56). Each cause produces but one predetermined effect (I, 586); the same beings always develop under the same conditions (II, 300); and the same races and species are preserved (V, 920). Because nature is bound by a contract, each phenomenon is mathematically predictable and predetermined. Hence the frequent use of the word *certus*; Lucretius' aim was not so much to explain how nature acts as to show the extent to which each act is predetermined and inevitable (III, 785, 792).

Lines that appear repeatedly, much like a refrain, in different parts of the poem restate the same conviction (I, 75; VI, 66).

The concept of the rigidity of natural laws reappears under various guises. This notion obsesses and saddens the poet; it explains his peculiar variety of melancholy which, in a manner of speaking, contains its own consolation. Unable to see anything in the universe except cumulative or compensatory forces and convinced that whatever is results naturally and inevitably from whatever has been, Lucretius takes pity on the human race. Man stands helpless in the face of blind, unchanging forces that are and will continue throughout eternity to be at work. Man is the accidental product of a wretched combination of atoms brought temporarily together by inexorable natural laws and destined eventually to be torn apart by the same forces. Does he have a purpose in the

universe? We think that matter was made for us, as if we were not subjected to its selfsame laws. We think that friendly or jealous gods protect or persecute us, as if unpredictable alien forces could intervene in nature, or as if we were not borne along in the all-embracing stream by the inexorable laws of matter. That is the source of Lucretius' melancholy and of his compassion for mankind.

From the same source, according to him, mankind must seek its sweetest consolations. Whoever complains of his fate is ignorant of the true nature of things; he imagines that he has struggled and cries as if defeated. If he reflected and raised himself to the "serene regions" of philosophy, he would understand that any complaint is useless and out of place, for nature inexorably follows her course without taking note of him. That is the explanation of the strange consolations which Lucretius addresses to the plowman, for instance, and which appear at first to aggravate the poor man's woes: "The plowman merely sighs and grinds his teeth; he fails to see that the universe is slowly moving toward its ruin." As Lucretius sees it, the only one who cries out is the one who has managed to convince himself even for an instant that resistance is possible. Similarly, he consoles the old man who is about to die: "Old age is forced by an eternal law to succeed youth; beings necessarily reproduce at the expense of other beings." If the old man were fully aware of the changeless and universal law, he would resign himself naturally. When the quantity of matter given off is greater than the quantity that nourishment provides, the body must of necessity waste away, and that is just: *jure igitur perunt* (II, 1142). His is certainly an original conception of human nature; he suggests that awareness of one's impotence is all that is necessary to provide consolation.

Lucretius thinks that by courageously pursuing his self-appointed task he will serve humanity. He devotes his nights to the endeavor (I, 140), paying little attention to the weakness of the Latin language (I, 136) or to winning renown as a reward for his efforts (I, 922).

His task is a pioneering one; he must make the Romans aware of truths previously unknown or misunderstood (I, 927, 832; III, 261; IV, 966). But he would never have shaped his thought with such precision or encompassed so much if he had not been acquainted with Greek philosophy, especially that of Epicurus.

## The Physics of Lucretius

From his theory of the atom Lucretius extracted a great number of scientific conclusions. In his poem the role of science is just as important as the role of philosophy, but here his explanations are often ridiculous.

Lucretius' shortcomings in the field of physics stem from several sources. To begin with, the poet failed to free his mind completely from the influence of mythological notions. It is pointless for him to state that the gods do not interfere in the world, that all beings are made up of atoms, and that all phenomena are movements of atoms; occasionally, and without realizing it, he sets forth the pagan notion that nature is animate and personal. He would of course condemn a theory which suggests that the earth is an animate being; yet we can not fail to note that he repeatedly compares the earth to the human body. It produces fully developed beings just as a mother produces children; it is first covered with grass just as the body is covered with hair (V, 788); its salty sweat fills the basins of the seas (V, 487). Those are not mere metaphors or poetic images; Lucretius gives no other explanation of the birth of living beings, the growth of grass, or the creation of salt water. As a matter of fact, we never completely rid ourselves of the ideas that surround us and condition our lives. Our language reflects our surroundings; we are unwittingly influenced by our conversations, by our reading, and by even the imaginary conversations which we engage in whenever we think in silence.

Note that Lucretius' mistakes in physics are often attributable to Epicurus. Scholars have succeeded in deciphering some fragments of an almost completely decomposed papyrus found in the ruins of Herculaneum. The papyrus contains one of Epicurus' books on physics; it is obvious that Lucretius followed his model very closely. Epicurus paid little attention to the science of physics; he was always ready to adopt the first explanation offered so long as it did not involve the supernatural. In astronomy especially the philosopher showed his utter contempt for pure science. According to him, the sun is approximately as large as it looks; celestial phenomena can be explained in a number of ways, and one explanation is just as good as the next; the moon may have its own light or it

may borrow light from the sun; the stars seem to rise and set because they are lighted and extinguished daily. Epicurus' ignorance or indifference is all the more surprising in view of the fact that the Greek astronomers had in numerous instances reached exact, indisputable results. Lucretius had the same confidence in Epicurus the physicist as in Epicurus the philosopher; this accounts for many of his mistakes.

In spite of all its shortcomings, however, it is impossible to read even the driest and most scientific parts of Lucretius' poem without repeatedly coming upon astounding truths which he glimpsed or predicted and which modern science must accept and confirm on the basis of controlled experiments, as we shall see later. Here we need only note that the method which he adopted was responsible for some of his discoveries as well as for some of his childish mistakes.

The scientific method, as practiced today, includes three steps: observation, hypothesis and experiment. Observation reveals the phenomena to be explained and reduced to laws; it enables us to state a problem. The mind then sets to work on the facts provided by observation; it formulates several equally plausible hypotheses for uniting, relating and, in short, applying the facts. Which of the facts should supplant the others? Each hypothesis must be considered in turn; it is assumed at first to be true; its consequences are deduced and verified by experimentation. If experiments prove that the original assumptions are true, the hypothesis stands; otherwise, the scientist passes on to the next hypothesis, and so forth. The result is that any scientific explanation will consist of a hypothesis which can be verified experimentally. The scientist must therefore be imbued with two important truths: (1) every scientific explanation is the result of an assumption expressed in the form of a hypothesis; and (2) no matter how simple it seems, no hypothesis is a scientific explanation unless it has been confirmed by experiment.

Of the three steps—observation, hypothesis and experiment—Lucretius practiced only the first two. He was a perspicacious observer, and hypotheses flourished in his fertile imagination. But he knew nothing of experimentation, even in the broadest sense of the word, and this explains the singular mixture of profound truths and childish errors that disturbs the modern physicist as he reads Lucretius. A vivid imagination made it possible for the poet to divine some of the great laws of nature; he sensed them intuitively. Since he started from a simple observation and followed no plan, however, he could discover the truth only by a stroke of luck; and since he was incapable of verifying scientifically

the laws that he discovered, he could not set them up as hypotheses, even if they were true.

It is easy to see why Lucretius almost always erred in detailed explanations which involved hypotheses that required immediate verification and why on the contrary he grasped and often expressed clearly some of the great theories which involved both his imagination and suggestions drawn from experiments, and which modern scientists have confirmed.

Take his theory of the atom. The remarkable fact is that after twenty centuries of groping, chemists can do no better than go back to the theory to which Lucretius applied the finishing touches. For modern scientists started by showing that although the number of bodies produced by nature is infinite, all bodies are composed of a small number of simple bodies or elements. And to explain how the simple bodies combine, they had to assume that they were made up of atoms. Suppose that two elements are placed together under ideal conditions. An atom of one element will draw one, two, or three atoms away from the second element; in this way complex molecules, each containing a definite number of atoms of each element, will be formed; and together the molecules will form a new substance as a result of the chemical interaction of the two simple elements.

But while Lucretius could base his theory of the atom on nothing more than vague observation and was therefore able to come up with only a plausible explanation, modern scientists have actually proved his theory. Their method was simple: they drew out the logical consequences of his hypothesis and verified them experimentally. They assumed that elements would interact and combine in exact and invariable ratios. It was assumed, for instance, that if an atom of element A attracted two atoms of element B and produced a molecule of compound C, then the new compound would contain two atoms of element B for each atom of element A regardless of the relative amounts of the elements involved in the chemical reaction, and that if more than the required amount of either element were used, the excess would not be a part of the new combination but would remain unchanged after the completion of the reaction.

Experimentation has verified their assumption. When an electrical spark is introduced into a mixture of hydrogen and oxygen, the two elements invariably combine in the ratio of one to eight to form water. When we use ten grams of oxygen and one gram of hydrogen, there is an excess of two grams of oxygen, and this excess does not become a part of the new combination. The atomic theory is thus verified experimentally.

Furthermore, if one atom of A combines with two atoms of B to form

molecule C, then three or four or five atoms of B should produce molecules D, E, F. And since each molecule which first had two atoms of element B would now have three or four or five, the ratio of the elements needed for the new combinations should be the same as three, four, or five to two. Experimentation has again confirmed the hypothesis. Nitrogen combines with oxygen to produce five main compounds. Analysis shows that for fourteen grams of nitrogen, the first compound contains eight grams of oxygen, the second sixteen, the third twenty-four, the fourth 32, the fifth 40. And this general law can be formulated in this way: There is always a simple ratio between different quantities of a particular element when they combine with a specific quantity of another element.

Thus modern scientists, by drawing out the logical consequences of the atomic theory and verifying them experimentally, have brilliantly confirmed the hypotheses of Democritus, Epicurus, and Lucretius.

It would be easy to show how Lucretius anticipated the great theories of our day on other points too, especially on the question of the origin of living beings. The similarity between the ideas developed in Book V of his poem and those of Darwin has attracted attention more than once. The resemblance is merely mentioned here and not stressed since transmutation is still nothing more than a hypothesis.

But Lucretius erred consistently whenever, departing from his overall views and his major hypotheses, he tried to explain specific facts. He assumed, for instance, that light came from luminous particles or images that break away from objects and strike the organs of sight, and that sound was emitted by sonorous molecules. His attempts to explain lightning, storms, and the like are but little better. Lucretius simply could not reach an exact solution in the absence of systematic observation and the rigid application of the experimental method. But what he lacked was only technique, not genius. Proof of this is his penetrating insight into the mechanism of the universe; it was he who first appreciated fully the principle that underlies modern science: nothing is ever created or destroyed.

## The Originality of Lucretius as a Philosopher And Poet

Epicurus borrowed most of his doctrine from the atomists and from the Cyrenaic school.

Atomism, one of the most profound philosophical systems developed in antiquity, was first expounded by Leucippus and his disciple, Democritus.<sup>1</sup> These philosophers held that the best explanation of the universe was the simplest one. It is obvious that countless tragedies and comedies have been created from the simple, invariable letters of the alphabet. In the same way, according to them, the numerous and varied phenomena in the universe, and the objects that seem to differ so greatly by virtue of their many shapes and colors, may well be reduced in the last analysis to very simple elements which are almost identical and which account for the wide variety of things through the infinite multiplicity of their combinations.

The simple elements which form material objects or bodies by combining, and which bring about transformations of matter by changing their places, are *atoms*.

Atoms are minute bodies so thin that they are invisible and so small that they are indivisible. In sufficient numbers they form a visible, tangible body. If we could carry the division of bodies far enough with the help of delicate instruments and, after breaking up a body, divide its parts and keep applying the process of division to the successive parts, we would finally obtain indivisible and even invisible elements, atoms.

Since the number of bodies is infinite, the number of atoms is also infinite. Atoms have existed since time began and are indestructible; they are eternal. Their only quality is form—not taste, smell, weight or resistance; they differ solely by virtue of their form. If we could see atoms, we would discover for ourselves that they have different forms. The number of possible forms is limited, but an infinite number of atoms can have the same form. Finally, atoms are changeless. Each of them is and will always be the same throughout eternity. An atom can not change; since it is indivisible, its parts can not be moved; nor can they change their quality, for they have none.

The bodies that we see daily are made up of atoms. They may seem to differ



strikingly, but that is because their atoms do not always have the same form. Two Greek words selected at random yield different sounds; this is because their letters are different. Furthermore, even when the atoms that constitute two bodies are identical and the same in number, the bodies will differ in appearance if their atoms are arranged differently. The syllables *an* and *na* do not sound the same even though composed of the same elements, for the order of their elements is not the same. Finally, even when identical atoms are similarly arranged, the two bodies will appear to be different if the direction or *orientation* of their atoms is not the same. The letters *n* and *z* do not sound the same, yet both are articulated at the same point.

The result is that different bodies on striking our senses appear to have qualities of color, weight, sound, etc. but actually do not; these qualities are mere appearances or impressions made on our sense organs. When we banish these illusions and consider bodies not as they appear, but as they are, we find that they consist of atoms and that atoms have none of those attributes. Since atoms can assume diverse forms and can be arranged and oriented in different ways, we should expect bodies to make diverse impressions on our senses, depending on the shape, arrangement, and orientation of their atoms.

And if a particular body seems to change its appearance from time to time, this is because its atoms have changed their places or been increased or decreased in number. The sound and sense of a word are changed completely when a letter is added, deleted or shifted.

How have atoms shaped the world in which we live? They are imbued with a natural movement that carries them across the infinite void. As they move, they collide, smash into one another, pile up. Our world is such an agglomeration or pile of atoms. This accounts for the formation, in succession, of the earth—the flat, hollow cylinder that floats in the air—the moon (which is like the earth), the sun, the stars and, finally, living beings. Even the soul, which seems to animate organized bodies, is made up of atoms; but its atoms are mobile, round and smooth. Successive thoughts are nothing more than the atoms of which the mind is composed. The mind perceives material objects or collocations of objects around it by virtue of the fact that these objects are constantly emitting in all directions tiny images that strike the organs of the senses. In short, bodies and souls as well as objects and worlds are composed of atoms; natural phenomena and thinking are movements of atoms; there has never been and will never be anything other than atoms, void, and movement.

Such was Democritus' system, perhaps the most perfect expression of

materialism.

Epicurus<sup>2</sup> was no scholar. He scorned the sciences in general, equated mathematics and falsehood, and showed contempt for rhetoric and letters. For him, the important thing was how to live happily. Therein lies the privilege of the sage, and the sole function of philosophy is to lead us to happiness by way of the shortest possible route. Only a little reflection will show that happiness consists of an inner peace, an unalterable serenity of mind. To know how to deal with the present and to guard against worry and fear—that is true wisdom and the ultimate aim of philosophy. Unfortunately, two concurrent forces constantly threaten our peace of mind. First, poor mortals imagine that good or malevolent gods watch over them, follow them about, spy on them and interfere at every turn. They look upon lightning as an omen or a punishment and tremble at the sound of thunder. They believe that supernatural forces are everywhere present; they imagine that they see them rise up before them from all sides, like the bogies that frighten children during the night. Then death itself appears to them, not as an agent of deliverance, but as the gateway to hell, the grim reaper, and every conceivable form of torture. The result of all this is that they devote their lives to fearing the gods and death; this dual superstition is a constant source of anxiety and crime; it poisons their lives and corrupts their happiness and their morality.

How can the soul recover the tranquility which it has lost? It must be shown that the gods take no part in the daily lives of men, and that death is the end of everything. Only through this knowledge will the soul regain possession of itself.

On considering the doctrines of his predecessors, Epicurus saw that atomism, better than any other system, could furnish the proof required by the soul. As Democritus showed, the universe is made up of atoms and combinations of atoms; all natural phenomena are explained by the movement and regrouping of atoms in accordance with mechanical laws, and it would be pointless for the gods to interfere. Men imagine mysterious and supernatural forces simply because they could not otherwise explain certain phenomena, especially those that appeal directly to the imagination, such as lightning. As soon as they are shown the natural chain of causes and effects, superstition will give way to understanding.

The fear of death will also be dispelled. For men believe in hell and demons because they think that the soul follows the body. But Democritus has shown that the soul, like everything else, is simply a combination of atoms. It therefore

decays after death, just as the body and all other things decay. Thus we have nothing to fear since no part of us is left.

That is why Epicurus adopted the atomic theory. But he added to it and modified it. His additions and modifications stemmed both from his abysmal ignorance of scientific things and from the originality of his approach. His aim was, in the last analysis, not to instruct men but to soothe them.

First, he reasoned that there must be a cause for the perpetual movement of atoms. He therefore posited a new quality, weight, and assumed that atoms are transported, by virtue of their weight, in the same direction and at the same speed across the infinite void.<sup>3</sup> Movement is in a vertical direction; atoms travel downward. If he had had a more scientific mind, he might have tried to determine their source and goal;<sup>4</sup> he might then have given consideration to Aristotle's assumption that weight results from the attraction of a center. But Epicurus could not be bothered with such trivialities; he was concerned mainly with the movement of atoms in the void; he felt that the layman, accustomed to seeing bodies *fall*, would think that he understood and be satisfied when told that atoms are heavy and that their weight carries them along.

But if by virtue of their weight they move in the same direction and at the same speed, how can they possibly collide, accumulate, and form bodies and worlds? We must admit, Epicurus answered, that there are scattered exceptions to the great law that governs the fall of atoms. Atoms may sometimes incline to the right or to the left and deviate slightly. This deviation, known as *clinamen*, obeys no law and is unpredictable; it is a capricious trait of atoms. It is difficult of course to visualize movement without cause, but when we realize that deviations are slight and the movements imperceptible, we are satisfied with our explanation and the minor concession has cost us nothing.

The formation of the world is easily explained. Atoms meet and collide; their collision makes the lighter ones rebound, and their upward movements combine with the downward movements to cause a rotary or spiraling movement. Atoms accumulate, and each cluster by virtue of its own movement becomes detached from the mass and constitutes a world. Because the number of atoms is infinite, there is an infinity of worlds, each differing profoundly from all the others. And since the movement of atoms is eternal, the formation of new worlds continues eternally.

The earth on which we live was formed relatively recently. First it engendered plants, then animals. There is really no reason for marveling over the arrangement of the different organs and attributing the creation of living beings

to an intelligent cause, for everything can be explained by the laws of matter. It is perfectly obvious that atoms, which are constantly moving about, uniting and disuniting, will naturally yield every possible combination during the infinite course of the centuries. The marvelous combinations that we admire today and call living beings were destined to appear in the course of time; they did, and since others unfit to live and perpetuate themselves disappeared, we see only the best, most perfect combinations and admire the supposedly intelligent order of nature. Fate alone brought them into being just as it also engendered thousands of others.

That is exactly how the human species came to be. The first men were veritable beasts who lived as such until they gradually became civilized through the discovery or invention of fire, clothing, the arts, home life and social institutions. Furthermore, mankind is destined to perish, as are the world in which we live and all the worlds spawned by chance. As a result of the movement of atoms, everything will one day disintegrate; the atoms, converted into dust, will be drawn together again; new combinations of atoms will produce new worlds; and so it goes, throughout eternity.

The human soul, like other bodies, is composed of atoms and subject to their laws. Its atoms also move naturally and inevitably by virtue of their weight as well as individually by virtue of their *clinamen*. When they move by virtue of their weight, the soul is passive and surrenders to their inexorable laws. But when they avail themselves of their faculty for deviating slightly by inclining to the right or to the left, the soul is active and takes advantage of its freedom. Finally, the soul will perish forever when death decomposes the body and frees its atoms.

Epicurus thus dispelled the vain phantoms that make mankind tremble. Death is no evil, for we are completely destroyed; nor are the gods to be feared, for they are incapable of interfering in the affairs of the universe since everything can be explained without them. Still, we must accept the fact that the gods have a real existence since we think about them and since every thought in turn derives from an image and every image from a real object. But the gods do not meddle in our affairs; they have no desire to do so; they prefer to converse with each other in Greek; conversation is the sweetest of pleasures, and Greek is a divine language. Immobile, immortal and eternally happy, the gods dwell in the regions between the worlds, where nothing disturbs them.

Such was the system of the philosopher for whom Lucretius expressed great admiration. To Lucretius, Epicurus was more than a sage; he was the matchless

sage and great benefactor of mankind. That is why Lucretius did not simply defer to him as a disciple to his master but rather worshiped and adored him as a god. Lucretius hesitates to speak after the sage has spoken (III, 6), for only a god could properly extol his vast, sublime discoveries (V, 1). If Athens had given the world nothing except Epicurus, she would have done enough for mankind (VI, 4).

At the beginning of almost every book, Lucretius inserts a pompous eulogy of Epicurus, and he does so without ever repeating himself. In Book I he lauds the courage and will power that Epicurus had to call upon to overcome superstition. Later, at the beginning of Book III, he praises the genius of the scientist who revealed the secrets of nature and of things. Finally, in Books V and VI, the poet stresses the superiority of Epicurean ethics. He explains that he owes his own new formulations to his master's influence and that because he has developed a cult around Epicurus, he is placing an invocation at the beginning of each book.

But even as he followed Epicurus closely and thought that he was translating him, Lucretius—perhaps unconsciously and certainly without wishing to do so—was singularly original. To see this we need only compare an extant portion of Epicurus' text with the lines used by Lucretius to translate and explain it. The comparison will show that through seemingly insignificant interpolations and stylistic devices, the poet gives a new turn to his master's thought, causing it to create a fresh impression on our minds. Let us consider briefly the scope of his contribution and the basis of his originality.

Epicurus apparently did not love nature. He did not study physical phenomena merely for the purpose of increasing his knowledge; he did not explain them to his disciples solely for the purpose of instructing them in the nature of things. Epicurus disdainfully rejected the notion of acquiring knowledge for its own sake or of learning something solely for future reference. He himself proposed three or four explanations for the same phenomenon. According to him, the whole purpose of knowledge is to banish gods from nature and combat superstition. Democritus' system appealed to him because it provided him with a vehicle for relating everything to mechanical and natural causes. Exactly what were these causes? The answer to him was unimportant, with the result that he gave puerile explanations for a great number of phenomena; the Epicurean doctrine, in fact, leads to futility in the study of any question not linked directly to everyday life and the pursuit of happiness.

But Lucretius was struck by the part of Democritus' theory treated lightly by

Epicurus: the absolute rigidity of the laws of nature. Everything consists and has always consisted solely of atoms, masses of atoms, and changes in the arrangement of atoms; atoms move on, eternally and inexorably; definite, changeless laws must govern the birth, growth and decay of things caught up and squeezed from every direction by the tight bond of necessity. And inspired by what he assumes to be the basic idea of Epicureanism, Lucretius discovers that while natural phenomena appear to follow no set plan, their infinite variety actually masks the movement of atoms in predetermined directions and the uniform force of immutable laws.

Lucretius, unlike Epicurus, was an enthusiastic observer of nature; he shows a unique gift for grasping its picturesque side—its fleeting, transitional variations. He manages simultaneously to appreciate the pattern that appeals to the geometrician and the pattern that appeals to the artist. He is like a great artist who stands before a model, admires its beauty, understands it, and captures it admirably on his canvas, yet can not prevent himself from analyzing it and breaking it apart anatomically into fibers and cells.

His ability to grasp outright the two-sided character of things is the source of the incomparable originality of his poetry, his philosophy and, to sum up everything in one word, his genius. Had he been satisfied to depict nature from the outside, his description would in all probability have been cold and hackneyed. Had he done nothing more than develop his atomic theory in Latin verse, his poem might have been more insipid than the writings of a geometrician. But his description is not cold, for we realize from the very beginning that he does not describe for the sheer pleasure of description; constantly preoccupied by the theory of the atom, he describes in order to instruct, with the result that each of his descriptions is imbued with an oratorical fervor that stimulates and sways. And his poetry is not dull; it is as vivid as nature; the poet does not depict collections of atoms in their stark nakedness, as did Democritus; instead, he decks them out, impulsively and in spite of himself, in natural or in fancied colors.

We need no longer wonder why Lucretius was so enthusiastic about Epicurus' system. We can be sure that the poet would not have written *De Rerum Natura* if he had seen in Epicureanism nothing more than a dry, self-centered doctrine contrived for the purpose of bringing to man the calm placidity of the beast and ridding him of his most noble anxieties. But by accepting the ethical consequences of the Epicurean doctrine and putting a high price on them, Epicurus managed to relate them to a great poetic idea which, though new to the

Romans, had been enunciated by Democritus and adopted by Epicurus: the eternal rigidity of the laws of nature. It is of course reasonable to argue that his theory of the atom is not conclusive, especially in its attempt to explain the soul and mental phenomena. But the indisputable fact is that the theory of atoms offers a poetic conception of the universe. Countless atoms that by virtue of immutable laws regularly move across boundless space, worlds that are constantly being shaped and destroyed, vast streams that are created by the calm and measured course of events determined by inexorable natural laws—all that is certainly enough to capture and enslave an imagination even less vivid than his. Nature takes on new majesty; no longer can any phenomenon be unworthy of description or any fact unimportant; all changes, great and small, have the same causes; the same forces are responsible for the rusting of iron and the decay of the universe; every description points up that same eternal truth.

Lucretius was able by adopting one of Democritus' ideas to give a new turn to Epicureanism. And his original conception of the nature of things brought him to an original conception of human nature.

Epicurus' doctrine, though not exactly mirthful, excluded melancholy, sadness, or anything else which might trouble the mind. When a man learns to rid himself of superstitions and childish fears, to renounce politics and even family life, and to banish his cares and quiet his passions, then his state of equilibrium leads to lasting happiness. His mind attains a placid state of joyfulness which, though not very intense, is permanent. The true Epicurean aspired to reach that state of quietude and undisturbed serenity. Against that, Lucretius drew a wholly different conclusion from the theory of the atom. Deeply impressed by the inexorability of natural laws, he felt compassion for mankind; for man must act and not achieve, struggle and not succeed, and be unwillingly drawn into the vortex of things by rigid natural laws. Why work or take pains to accomplish anything? Why struggle or complain? We are victims of a common law, and nature shows little concern over us. If a wind bearing noxious germs blows across the earth, an epidemic will break out, men will die, and the gods will be powerless to act. And the poem ends with a frightful description of the plague of Athens.

Lucretius tried to show the powerlessness of men and gods in the face of natural laws. He tried to paint an awesome picture, to fill our minds with dread, and to make this our last impression. He succeeded. His deep pity for suffering humanity evokes our sympathy and makes us love him. At the same time, it imbues his doctrine and his poem with priceless originality.

<sup>1</sup> Democritus was born in Abdera c. 460 B.C. and died c. 370. He traveled in Egypt and Asia, then settled down in his native land, where his fellow citizens called him “the Abderite.” He wrote on all subjects—mathematics, physics, ethics, grammar, agriculture, etc. Only unimportant fragments of his writings are extant.

<sup>2</sup> Epicurus was born in Gargettos, near Athens, c. 341 B.C. and died in 270. Shortly after he began his studies, he formulated a new doctrine which he taught first at Mytilene, then Lampsacus, and finally Athens. In Athens he bought a garden where his students gathered. It is said that they lived on unleavened bread and clear water. His works, three hundred according to Diogenes Laërtes, have been lost; Diogenes cited a few passages from them; fragments of his *Treatise on Nature* were found on parchment at Herculaneum.

<sup>3</sup>A historian of philosophy, Zeller, states that Democritus had probably already attributed weight to atoms, but the writings of Aristotle (*Metaphysics*, I, 4), Plutarch, and Stobaeus contradict his statement. Even if he did attribute weight to atoms, Democritus did not posit it as the cause of their movement; credit for this goes to Epicurus.

<sup>4</sup> It is true that Aristotle had also spoken of up and down as real things (*Physics IV*), but he had at least tried to adduce reasons.



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