Book I

Mother of Aeneas and of his Rome, and of gods
and men the joy, dear Venus, who underneath the gliding
heavenly signals busies the seas with ships and makes
earth fruitful (for only through you are living things
conceived
and because of you they rise up to bask in the light of the
sun):
from you the harsh winds flee and the skies' black storm
clouds scatter
at your approach; for you the intricate earth sprouts
flowers,
wide ocean roads subside into gentle smiling, and furthest
reaches of heaven glow serene in response to your
prompting.
In the spring's first days, the nurturing western breezes
breathe
free again, and birds in the air, smitten by you,

warble the news of your coming, as beasts of woods and fields
cavort in the meadows and splash through brooks—and all
for love.
Under your spell, all creatures follow your bidding, captive,
eager even. Look to the teeming seas, the mountains,
the fast-flowing streams, the treetops, or rolling gorse where
birds
flutter and dance the reel of lust as earth once more
renews itself as you have ordained, for you alone
govern the nature of things, and nothing comes forth to
the light
except by you, and nothing joyful or lovely is made.
I seek, therefore, your blessing and help in writing these
verses
that I presume to compose on the Nature of Things,
the way
things come about and are—for Memmius's sake, my
friend
whom you have favored, goddess: for his sake give me
words.
Make it happen that war interrupts its savage work
on land and sea, for this would be within your power
and you can bring to mortals that peace we long for as
Mars,
who is mighty in warfare and rules over bloody deeds,
adores you,
will lay his head in your lap, defenseless, utterly vanquished
and altogether undone by love's unhealable wound.
Gazing upward at you, his neck stretched back, his eyes
feeding upon your beauty as, breathless with adoration,

he listens while you let fall from those luscious lips your coaxing
that for your sake, sweet lady, he allow the Romans peace—
for in times of trouble and threat, I cannot perform my task
nor, so beset, can the Memmii's noble son neglect
his duties' demands. I pray for peace, such as the gods,
immortal, enjoy, cut off as they are from the world's woes.
Free of all threat of danger, divinity has no need
of us and our rites or reason to fret at our impotent anger.
  For the rest, Memmius, friend, turn your keen mind, detached
from the cares of the office you hold to these philosophical questions
that I will address and with all my talents attempt to make clear.
Do not turn away or hold in contempt these earnest
efforts but give me your patience while I expound for your
understanding the laws of the heavens, explain the ways
of the gods, and reveal first principles—how all things in nature
are made, how they increase and are nourished, and how in its time
nature dissolves them again and reduces them back to the seeds
of what we refer to as Matter: what we explain is being
and becoming, for from these primary bodies all things arise.
  It was long the case that men would grovel upon the earth,
crushed beneath the weight of Superstition whose head

loomed in the heavens, glaring down with her dreadful visage
until Epicurus of Greece dared to look up and confront her,
taking a stand against the fables and myths of the gods
with their stories of those impending thunderbolts from above
and the vengeful roar of the skies that merely provoked his courage
and strengthened his will to defy them and shatter the bars of the cage
where Nature was kept in confinement. By the lively force of his mind
he triumphed, forcing a breach through flaming walls of the world
to travel the universe in thought and imagination
and return from his adventure bearing the prize of knowledge
of what can come into being and what cannot, the limits
of the powers of things and their clear and orderly boundary lines.
Superstition is now unseated and trampled down
while by his thought is mankind exalted as high as the heavens.
But one thing gives me pause—that you may see in my effort
to tread the paths of reason some risk of impiety. No!
the opposite is the case, for Superstition produces
wicked, even unholy, behavior. Think of that host
at Aulis where Diana's altar was fouled with the blood
of Iphigenia: they decked the maiden's hair with the fillets

of sacrifice and she knew, when she saw her sorrowing
father
surrounded by his attendants hiding the terrible knife
and the people assembled weeping silent, bitter tears,
what was about to happen. Think of that poor girl
who looked in vain to the king whom she had first called
father
and trembled as men laid hands upon her and bore her not
to a flower-decked marriage altar with songs of loud
rejoicing
but a sorrowing victim, immaculate virgin, to be defiled
by her father's hand in order that fair winds favor the fleet.
By Superstition we are driven to deeds of such great evil.
Someday even you may listen to one of these priests'
empty threats and, in need or a moment of weakness,
be tempted
to listen as they conjure their vain dreams and sow
seeds of doubt of the rules of right living and put
your welfare at risk. It sounds good enough, but men, if
only
they saw some limit to tribulation, could answer, summoning
strength to defy the threats of their myths and superstitions.
Who is so tough-minded that he can resist their stories
of everlasting torments they tell us we face after death?
Who can say for sure what the soul's nature might be,
whether it is born with us or in some way existed
before we were born and somehow installed itself? Who
knows
whether it dies when we do or lives on somewhere as a shade
in the huge caverns of Orcus's gloom, or can it live on

here on earth, perhaps in some animal's being? So
our own great Ennius sang, who first brought down the
laurel
from Helicon's height to win fame among the Italians.
In immortal verse, he proposes as well another idea—
that of the gloomy realm of Acheron, where neither
bodies nor souls endure except as the vaguest likeness
of what they had been in life. There, he imagines Homer,
ever-blooming and fresh, arising before him, weeping,
as he begins to expound on the hidden nature of things.
What we have to do is establish first principles: stars
and the sun and moon and how they move about in the
heavens;
and what are the laws that govern what happens here on
earth?
And before everything else, we must observe and reason
precisely
about the source of the spirit, the *anima,* and its nature,
and also that of its partner, the *animus,* or mind.
How can it happen that things we encounter in waking
life
return to appear before us in terrifying aspect
when we are afflicted with illness or deep in sleep and
dreaming,
so that we see and hear—or think that we do—close by us
these wraiths, these simulacra, of those who are dead
and whose bones
we well know lie in the earth's unremitting embrace?
I am not unaware of how difficult it will be
to make clear in these Latin verses obscure refinements

of what the Greeks discovered. Our language needs to be stretched
and we shall be forced to invent new words for the new occasions
I know will arise. And yet I undertake this task
your merit deserves, in the hope that I may find delight
in your continuing friendship, for the sake of which I labor
awake through the silent nights in my search for the right words
and cadences I may use to cast that bright, clear light
in your mind of understanding of the hidden heart of things.
This terror, then, of the *animus,* this darkness of mind must be
dispelled, not by the sun's light or its rays' shafts
but by careful observation and understanding of inner
laws of how nature works. To start with, the first rule
is that nothing can come from nothing, not even by will of the gods.
Mortal men are afraid as they look about them and see
the many things that happen on earth and up in the sky,
and they cannot tell why or how and therefore think that gods
must bring them about by fiat. But if our axiom holds
and nothing can come of nothing, then we are obliged to look further
to learn what we want to know—how each thing was created
and how, without the gods, all things have come to be.
Consider the contrary case—that being could come from non-being

and that anything could arise from anything or from
nothing,
without even a seed. Men could emerge from sea-foam,
scaly creatures could come swarming up from the earth,
and birds could burst forth from the sky. In meadowlands
or deserts
cattle and wild beasts could simply appear at random,
and trees could bear any fruit haphazardly, for all
would be able to bring forth all, interchangeably. No
bodies would produce their own kind: the idea
of motherhood and fatherhood would give way. But it
is not
so, and we know how each kind comes from its seed, in
a fixed,
unvarying manner, and everything that is born and makes
its way
to the light has its material source in whatever came
before it. It cannot happen that things can arise and be
begotten from anything else: in each is a unique nature
and individual power that sets it apart and defines it.
Why do we always see roses bloom in the early spring
or grain grow in the summer's heat, or grapes on their
vines
ripen in season in autumn, except that these life forms
know
from the code that was there in their seeds what to do and
when
so that the teeming earth brings forth in safety its fragile
beings that grow in the sunlight? Suppose that they just
appeared,

popping up out of nowhere at unpredictable moments,
would they not come out of season at hostile times of the year
without some initial prompting, with neither restraint nor order
of generation that offers nature's many protections?
And speaking of generation, what would be the need
of time for maturation? Why would there be any wait
for infants to grow into youth or seedlings to turn into trees?
But as we know well, one step must follow another
as seeds
sprout to become plants, preserving their own kind,
and they grow in their proper seasons nourished by what is ordained.
Consider as well how the earth has its fixed seasons of rain
without which it could not put forth its delightful yield of crops,
and animals then would starve for want of proper fodder
by which they maintain themselves and renew their kinds.
Think
how letters make up words: in such a way are different
bodies composed of the same elements that they all
share and in lack of which none could come into being.
Otherwise, why could not nature produce what we dream up—
enormous men, so large they can wade across deep oceans
or else with their bare hands tear great mountains asunder,
and outlasting generations of ordinary life,
except for the limitations ordained from the start not merely

of flesh but of matter itself? We must therefore conclude
that nothing can come of nothing and each thing needs
some seed
from which it can germinate to be brought forth into
the air's
gentle breezes. Lastly, we know how tillage is better
than barren desert and soil that is worked gives better
yields,
and from this we can reason back to the start of things
that we bring to birth with the earth's clods broken up
and turned
by a plowshare's blade. Otherwise, you would see, without
the need
for labor, the fruits of the soil pop up on their own and
flourish.
Consider too how in nature things never disappear
but are all resolved again to the elements that first
made them. If matter just ceased to exist, then objects at any
instant might simply vanish without any need of force
to loosen the ties of their parts. But the seeds of things
are eternal,
and nature does not allow, without some forcible blow
that shatters or penetrates, for objects to be destroyed.
If we allowed that time could devour matter, then how
could Venus restore the races of living things to the earth,
bringing each kind again and again to the light of life?
And how, when she does, could the earth, that clever
contriver, foster
its nurslings, providing appropriate sustenance to them all?
How do the freshets continue to feed the brooks and springs

that pour down from afar to replenish the oceans? How
does the sky maintain the stars? In time's infinite stretch
of days, how is it that all things we see of mortal
body have not been devoured? We take it too much for
granted,
but these ephemeral beings, blessed with an immortal
nature,
are somehow replenished over the course of the ages: they
cannot—
and, indeed, they do not—disappear into non-being.
By the same cause would all things without any distinction
be destroyed unless matter, itself everlasting, held them
through time together enmeshed more closely or less in its
bonds;
for the slightest touch would suffice for the destruction
of things without
these particles that are immortal and that make up the
world's body.
Some force is needed to sunder their texture and make
them dissolve.
But since there are bonds that hold these elements
together,
and since matter is everlasting, things do abide and persist
until some force appears that is great enough to disturb
them,
and then things do not return to nothingness but, disrupted,
are reduced to the elements of which they were first
composed.
Raindrops, when the ethereal father has cast them into
the lap of the earthly mother, may pass away, but green

crops arise from the soil and branches on trees bud
with new leaves and later with blossoms and then they bear
their fruit.
From this we and our kind and other kinds derive
our nourishment; from this comes the wealth of cities
where
children play in the streets and the plenty of country scenes
where songbirds frolic in orchards and raise their chicks;
from this
come flocks and herds that graze and lay their weary, fat
bodies upon their pastures' greenswards to chew the cud
or give suck to their young with milk from swollen udders
while the kids and calves on the grass gambol on wobbly
legs,
their hearts made glad by their drinking. And what do
these pictures tell us
but the fundamental truth that nothing passes away
utterly, but nature makes use of it and renews
one thing with another? Nothing is born into being
unless by this re-deployment of something else that has
died.
Now that I have explained how nothing can come from
nothing
and that once a thing is brought forth it cannot return to
nothing,
let me buttress my case lest you harbor still some doubts
and find cause to distrust what I have been expounding,
for these minuscule atoms cannot be seen by the naked eye
but rather must be understood from inferences that we
draw about what must be there, whether we see it or not.

Imagine a mighty wind that comes up to beat on the ocean
to overwhelm huge ships and scatter the clouds in the sky,
sweeping along the plains with hurricane force that trees
bow down to or rise up to join as their branches fly,
and the blasts are so strong that even the mountains shudder.
You can feel its fury and hear its savage, threatening howling.
You cannot see this wind that roils the sea and sweeps
the earth and harries the clouds across the sky's expanses
this way and that, but you do not question that it is there.
You've seen how water behaves, how gently purling brooks
can suddenly rise up, bursting their bonds and wreaking
havoc when a deluge of water comes pouring down
from the mountains' melting snows to dash against trees and destroy
forests. Not even the strength of stone can withstand its force,
and bridges give way to these torrents as they boil about their piers.
With an awesome uproar it spreads its terrible devastation,
tossing enormous boulders along in its currents and sweeping
away whatever may lie in its catastrophic path.
In just such a way can the blasts of a mighty wind bring ruin
to whatever stands in its way that its eddies scatter, shatter,

and carry off in a moment, the rival of any great river
in flood, although no man can see the wind that is surely
there. Therefore I say that if wind, although unseen,
and water behave in similar ways, then wind as well
as water must be possessed of some material body.

Think, for that matter, of smell, and how we can discern
the various odors of things that we may or may not see,
but we are aware of their presence. Consider how we feel
scorching heat that we cannot see with our eyes or bitter
cold. Likewise, we perceive sounds, which have some
substance
that we can make out with our senses but cannot behold
with our eyes.
Nothing can touch or be touched, affect or be affected,
unless it be possessed of some kind of physical body.
Clothing you hang on a line near the shore in the surf spray
will grow damp but these garments spread out in the sun
will dry,
but nobody sees that dampness pervade them or then,
in the heat,
disappear, but the water was there in its minuscule
particles that the attentive eye could never discern.
Over the course of time, the gold on a ring will wear
thin by the finger's flesh, as the constant drip of water
will hollow the hardest stone. The curved blade of the plow
dwindles down as it works the clods of earth, and the feet
of many men will erode the stony pavement of roads.
You've seen the hands of statues that men have set by
gateways

that those who pass have touched in greeting, rubbing
them thin,
and at each of these encounters, some particles must wear
off that are far too tiny for our crude eyes to discern.
Observe as closely and keenly as anyone can the way
things grow in nature—a plant, for example, that adds
to itself
little by little and over the course of time is clearly
larger. Or think of the opposite case, of something
that time
diminishes—an overhanging rock that the waves
of the salt sea gnaw, but you cannot see what is lost at each
occasion. We therefore conclude how nature's workings
depend
on the actions—and therefore the presence—of bodies
that are not seen.
On the other hand, it is also true that things in
the world
are not clumped together in one solid mass, but instead
we must suppose there are also voids or empty spaces.
This, I think you will find, is a necessary notion,
without which you are likely to wander in some
confusion—
at a loss as to how the world is made and also distrustful
of what I am here proposing. There has to be empty space,
emptiness that allows for the possible movement of things
from one place to another. Otherwise bodies, fixed,
could go neither forward nor backward in space that was
already filled.

But things, as you have seen yourself, can move at sea,
on land, and across the heights of heaven in various ways.
Were there no voids, they could not possibly manage to
do this,
for matter then would be packed in one continuous mass.
This is not to say that solids are not all the same, for some
are permeable, as the rocks in certain caves must be
to allow the water that oozes through to collect in drops
so that the walls are dripping or even appear to weep.
Think how in the bodies of living things the food
is dispersed to all the parts. Trees grow and put forth their
fruits
nourished by what the roots take from the soil below
that flows up through the trunk and then out through
the branches.
Sounds can pass through solid walls of rooms in houses,
and cold can come through the clothing to permeate to
the bones.
If there were no voids, no spaces through which these
things
could somehow manage to pass, you would not see these
effects.
Finally, why is it true that you see two objects the same
in size but different in weight? A ball of wool, for example,
weighs less than a ball of lead of exactly the same
dimensions.
How could this be, if it were not for voids in the ball
of wool?
The lead is more compact, which gives it that greater heft.
We must therefore conclude for such good reasons as these

that intermingled with matter there must also be voids.
But here let me forestall an idea that could be
posed as an alternate explanation, lest it should beguile you
and lead you away from the truth. Some philosophers argue
that water yields to the pressure of the fish in the sea, that it opens
before them and closes behind, and from this they generalize
to a system in which all things move in and out, exchanging
places with one another. It's possible, is it not?
But, no, upon further inspection, it makes no sense whatever,
for where would the water go, and from where could it then close back
upon itself, and how, in the first place could the fish
move at all? For things to move, there must be spaces
intermingled with matter and allowing this to happen.
Lastly, let us suppose two objects set in motion
after a sudden impact, leaping apart . . . What happens?
Air comes rushing in to fill the void they make
and however quickly that happens, the currents of air that arrive
to fill the space cannot do this all at once
but must go, as all matter does, from one point to the next.
Or do you perhaps suppose, when the objects separate,
that the air is somehow compressed? But this cannot be the case,

for then a void would be made that had not existed before,
and a void that had existed would have to have been
filled.
Besides, the air cannot have its parts compressed that way,
withdrawing into itself as a more compact mass.
Object however you may, you must at last concede
that there is a void in things. Look around at the world
and other demonstrations will come to your eye to buttress
what I am saying here. For a keen mind like your own
it won't be at all hard. Hounds can follow a trail
on a leaf-strewn mountainside once they have picked up
a scent.
So, too, will you follow the trail of my exposition
and see for yourself how logic leads from one thing to
the next
to draw forth truth from that hidden lair where it hides
in the brush.
But should you not rise to the task or falter from time to
time,
I promise you Memmius, friend, to do what I can to whet
your appetite for wisdom with melodious speech I pour
forth.
I will do my utmost to offer bounteous draughts of the
treasure
stored in my mind, lest age should sap the strength of our
limbs
and loosen the bonds of our health before I have won you
over.
But let us return to the task of weaving this web of
discourse.

Everything in nature is made up of two things,
for there are, on the one hand, bodies, and then, on the other,
voids in which these bodies are and through which they move
one way or another. Our common-sense perception declares
that every body has its own separate existence,
and we must base our belief on what our senses report,
for this is the starting point from which our reason proceeds
to reconcile and refine and to tease out hidden truths.
This is how we arrive at our views of matter and voids,
and their logical need if we are to make an account of motion
or even an object's location as we have just now seen.
There is nothing else in the world but matter and void: there is no
third mode of being in nature. Whatever there is
must possess physical properties our senses can report.
However small it may be, it will have heft and substance,
and, providing that it exists, can be weighed and measured.
But if,
on the other hand, it is an intangible and empty,
allowing things to pass through it at any point or direction,
then it must be what we have defined here as a void.
If it acts or is acted upon, then it must be a body,
but if things can be in it or move through it, then it is a void.
But there can be nothing further, no third thing that remains

that our senses can perceive or our reasoning understand.
  Whatever we call by a name must either be possessed
of properties of these two or of accidents of the same.
A property is that which can never be separated
without a thing's destruction and dissolution—as weight
is a property of stone, or fluidity of water,
or touch to a body or intangibility to a void.
But slavery or wealth or poverty or freedom
or war or peace . . . whatever may come and go while
    the thing
itself remains intact, its nature still the same,
these are what we may distinguish as accidents.
Time has no independent existence but it derives
from things and our sense of what has been done in the
    past
and come to a close, what is now present, and what is to
    follow
later on. No one could have any sense of time
except from things that move and change or else remain
    still.
When men talk of the rape of Helen or speak of the Trojan
War, we may wonder how these things may be said to
    "exist,"
for what took place in the past to generations of men
that have long ago departed may be classed as accidents
of the countries involved or at least the regions where these
    things happened,
for without the people, the substance, the space in which
    these things

"took place," as we say, no fire could have been fanned into
flames
of love for Tyndareus's daughter to burn in Paris's heart
and set alight the blaze of savage war; no horse
gravid with night-born Greeks could have fooled the sons
of Troy.
As you see, then, actions—events—do not exist in
\themselves
as a body does or a void, but are accidents of these.
The next point is that bodies are partly primordial
things
and partly formed of the union of these primordial things.
Those things which are primal, no power can quench, for
they endure,
solid, stolid, unchanged. But what, you ask, can they be
and where in all creation can such solid bodies be found?
The thunderbolts of heaven pass through the walls of
houses
as sounds can do, and voices; iron turns hot in fire,
red and then white; stones in great heat will sunder,
as gold will dissolve to liquid in that fire, or icy bronze
will yield and melt. You have held in your hands cups
wrought of silver
and your palms have felt how both heat and cold will pass
through the metal
from the liquid within. So how can there possibly be such
solids
when everything seems to change and shift. But let us
reason

and observe more closely and parse what nature's constraints imply
as we expound in these verses how there may be everlasting
things with solid perdurable bodies, the seeds and the first
beginnings from which all things we see in nature are built.
We agreed that nature is two-fold, and whatever there is must be
composed of the two dissimilar things, which are bodies and space.
Each must exist unmixed, for whatever is empty or void
cannot contain any matter. Likewise, what we call matter
cannot include voids or empty spaces, for bodies
are solid and do not have voids. In any created thing,
where there are voids there must be solid matter around them.
And, by the same token, reason tells us that voids must have
solid matter containing them within it. What we
behold in the world is therefore a compound of matter and voids,
each of them everlasting and each of them needing the other.
Without the voids, the universe would have to be one huge
solid. And in the same way, without matter, the world
would be all void, vacant, an enormous, empty space.
Therefore, without any doubt, through logic, we must conclude,
since the world is neither completely full nor yet completely
empty, that there must be both matter and empty space,
each separate from the other. The bodies cannot be dissolved,

destroyed by blows from without, nor pierced, nor
decomposed
from within, nor assailed, nor shivered, as I have already
explained,
for without voids nothing is crushed or split in two,
or shattered, or broken; nothing can let in liquid or cold
or heat by which things are destroyed. But the more a thing
has voids,
the likelier it can be shaken or undone by whatever
attacks it.
Therefore, if these primordial things are entirely solid
and have no voids, they are—and they must be—
everlasting.
Think of how it would be if this were not the case:
if matter were not everlasting, then things long ago would
have all
returned to nothingness, and whatever we see before us
would have been born from nothing—which, as we have
agreed,
simply cannot happen, for nothing can come from nothing,
as what has been created cannot be reduced to nothing.
There have to be first beginnings, primordial pieces of
matter
into which things are resolved at their last moments, units
that recombine and from which all new things must arise.
These primordial bits are therefore solid, unitary,
which is the only way they can have lasted from time's
beginnings through the ages, making each new thing.
Go at it another way and think how it would be
if nature had not provided a limit to how far things

could break up or break down. By now, the relentless
grinding
down of things of all the ages that have gone by
would have so far reduced all matter that nothing could be
conceived, let alone be brought to birth in the world. It only
stands to reason that things will break down faster than
they
can be built up or than they can be made anew.
Those infinite aeons of matter breaking down and
dissolving
could never be made good, reversed, or repaired again,
except for some limitation beyond which nature does not
deteriorate—since we see how things persist or even
reappear in the world, each after its kind
in order to re-attain what we call the flower of life.
Now even if matter is solid, still we must give some account
of how it can be that certain things in the world are soft—
air, for instance, or water, or fire, or, sometimes, earth—
and how these are formed and what forces govern the way
they behave
once void has been intermingled. The contrary idea—
of things that were soft from the first beginnings—is hard
to defend,
for how then would we account for the hardness of flint
or iron?
Nature would lack that foundation on which creation
is based.
Solids and single atoms have to exist, which, packed
more densely together, can show a greater hardness and
strength.

It also stands to reason that if there were no natural limit
to how far things could break down, it would be strange
indeed
that after an infinite time, bodies of every kind
remain and have somehow persisted, never even in danger.
For if all things can dissolve, how could they have remained
over time everlasting, exposed as all things are to assault?
Likewise, there is also a limit set to the size
to which things can grow, each true to its own kind and type,
and each with a finite lease on existence. So nature decrees
what each thing can do and what it cannot. In the world,
nothing seems to change and everything proves to be faithful
to what was intended: thus, birds in succeeding generations
display those same markings by which their kind is
distinguished,
just as their bodies are made of immutable bits of matter.
It would follow, if those primordial bits could be altered
or changed
or in any way transcended, then consequences would not
necessarily follow and anything then could arise
from anything. But this does not happen, and each
thing has defining limits that order the generations
that repeat themselves in nature in the parents' forms and
behaviors.
We know there are tiny bits that exist at the very edge
of what our senses perceive and can report: and there
at that tiniest point, the smallest possible thing exists,
without component parts, but a part of something larger,
for, lacking in weight or force, it cannot exist alone
but must join with other tiny bits to be part of something

else, another and larger thing to which it adheres,
each in its own place, organized and arranged
in such a way that these atoms cannot be torn away.
These atoms, these first beginnings, are single, solid, small,
closely compact, cohering, not made of component parts
but strong because unitary and eternal because in nature
nothing may tear them down, erode them, or further diminish
these minuscule things that persist as the seeds for all that is.
Simple logic requires that there be some ultimate smallness,
some tiny thing that cannot be further subdivided,
otherwise each mote would consist of infinite parts,
each of which would of course be divisible yet again
into another set of infinite parts, and so on
and so on, with no limit to the endless diminution.
What difference then would there be between the sum of things
and the least of things? Both of them infinite? Both equal?
But that is where we should be, with the infinite absolutes
of largeness and smallness—but reason rebels against such a notion,
and the mind balks. You must, therefore, agree and yield,
confessing that there are things that cannot be further reduced
to a set of component parts because they are already
as small as things can get in nature. These things, then,
must exist, these atoms, solid, and everlasting.

Finally, think how if nature, the great creatrix, had planned
for things to be resolved to infinitely tiny
parts, then she could not reconstitute from these
the things we see around us in all their rich and diverse
qualities that she achieves by the process of augmentation
from the generative matter from which all being derives.

Speaking, as we have been, of nature's need for difference
in the seeds of things, let us consider the theory that fire
is the source of whatever exists, the original parent substance.
This cannot be correct. It was Heraclitus who said so—
a famous Greek, but hardly one of their serious thinkers.
A lot of those silly Greeks adore rhetorical tricks
and mystic pronouncements that may be attractive but
never enlighten.
That kind of thing is for fools who love what they can't
understand,
are impressed by opaque propositions, and suckers for
ornate style,
whatever fine-sounding phrases tickle their gullible ears.
But what he doesn't and can't explain is how things are
so various here in the world, if they all are descended from
fire,
pure and simple, for how is fire more or less dense?
Are particles of fire, the individual sparks,
of the same nature as that which we find in the whole
blaze?
Are the particles compressed in a hotter and more intense
fire? Or contrariwise, when they are dispersed, does it
burn
with less heat? Or do these questions even apply?

But you have to suppose some kind of differentiation
to account for the wide range of material things in the
world,
and what can fire do but burn with more or less heat?
There is also another problem: we've agreed that matter
is mixed
with voids, but how can it happen that fire can grow more
dense
and still be left as rare as it is. Believers in fire
shrink from these heights and in fear lose the path of truth.
Without these voids all things would have to condense and
congeal
into one solid body from which not even heat
or light could escape, as we know happens with any fire,
which clearly means that it cannot be packed together this
way.
In a closer or looser union, fire would be changed
and its substance would no longer be fire, in which case
there would be no heat or light in the world. Fire
would perish to nothing, and it would follow that all things
are made of nothing. It also is true that if fire is turned
into something else, then fire would perish, no longer be
fire,
for something must persist in things, or they turn into
nothing,
in which case the things that are would have to be born
of nothing.
But surely there are some things that persevere,
their nature always the same, no matter how often they
come

and go, transforming themselves, and reviving—and we may be certain
that these things cannot be made of fire, agglomerating
and fracturing, changing place, and retaining the nature of fire.
Whatever came this way would still have to be fire.
But I think the truth is this—that there are in the world bodies
which, by their positions, relations, motions, and order,
can produce fire and which, when their order is changed, change
the nature of the thing that they make up together,
but they are not like fire nor indeed like anything else
that sends out bits to the senses or that we are able to touch.

Further, to say that all things are fire and that nothing
of all the number of things is real excepting fire
as this same person does . . . It strikes me as utter madness,
for what he is fighting against is what his own senses tell him,
which makes no sense whatever and cuts at the root of belief
through which he knows all things—including the thing he calls
fire, for what his senses report to him as "fire"
is different from everything else that is just as clear to his sight
or touch or hearing. He has to be stark staring mad.
To what else can we appeal except our senses? What else
do we rely upon to distinguish truth from falsehood?
Why attempt to deny that everything else is real
and only accord that odd honor to fire, rather

than say that fire too is unreal and doesn't exist,
and then substitute something else and acknowledge
its "being"?
Whichever side you come down on this question, it's
cuckooland!
Therefore, they're equally wrong: those who think that
fire
is what all things are made of and the universe itself;
those who think that air is the primary element
from which all things arise; those who say that water
creates all things by itself; or those who opt for earth
that somehow by changing itself produces all that there is.
They have all strayed from the truth. Similarly those
who combine, say, air and fire, or water and earth, or all
four of these things together—earth, fire, air, and water.
Foremost among the men who speculate in this way
is Empedocles, the poet, who lived in Agrigento,
in Sicily, that triangular island washed by the green
Ionian sea and sprayed by the salty spume of its waves
that divide it from the mainland. There is the ruinous
whirlpool
in which Charybdis lurks, and there is the mighty Etna
rumbling its threats that it sometimes makes good with
flame
that bursts forth from the depths of the earth to hurl to the
skies
its flickering tongues of fire. This island boasts of many
great wonders that people come from all over the world
to see and admire. It is a fertile place and stocked
with many fine men, and yet it can boast of nothing greater,

finer, or more sacred than that this man lived here—
Empedocles, whose poems speak in a loud clear voice
the thoughts of an adventurous mind that seems to transcend
what we have always thought was the limit of mortal men.
  My admiration for him is all but boundless, and still,
although there is much in his thought and work that merits
praise,
as there is, indeed, in the work of men who are less than he,
but still in their various ways, rich and even inspired
in their vision of things as they gave their explanations and
answers
that seemed to come from a source at least as holy and far
more sure than the Delphic priestess sitting upon her
tripod
pronouncing the words we suppose must come from
Apollo, yet
all these eminent thinkers and writers stumble and fall
when they address the question of how things came to be.
Great as they were, so too were their falls from correctness
great.
Think how they all assume motion and yet do not
allow for voids in which such motion would have to take
place.
They propose, instead, some softness and rarefaction, so air
and sun and water and earth can mix and mingle in beasts
and crops—and yet without any voids in their bodily
structures.
Think also how they place no limit upon the division
of parts into smaller parts or fixed point beyond which
nothing can be further reduced; in other words,

they deny that there is an extreme point beyond which,
as our senses
tell us, there can be no further breaking down.
We have already reasoned that just as there is a minimal
point
below which things cannot be perceived by the senses, so
there must be a least extreme in what we cannot perceive
but that nevertheless exists invisibly in nature.
And then, in the third place, think how they assume
that the first beginnings in nature are soft, which is to say
entirely perishable—and thus must return to nothing,
which of course means that things must also arise from
nothing.
We have agreed that both these views have to be wrong.
Furthermore, these things are incompatible, hostile,
poison one to another, so that when they come together
they perish or fly apart, as when in a gathering storm
we see the thunderbolts and the wind and rain contending.
Besides, if from these four things the rest are created
and then resolved again into the four from which
they came, how can one say that they are the first
beginnings?
As easy to look at the process the other way and say
that from all the things that exist, four elements result.
These four are begotten, one after another, and change
their color and their nature, each giving way to the next
in an endless, timeless progression. If you suppose that fire
and earth and airy wind and water can come together
without changing the nature of each of them, you will see
that it can't happen, and nothing, animate or not,

beast or tree, can arise—for each of the elements mixes
only in discord with the others, and each will show
its persistent nature. Air and earth, or fire and water,
cannot abide one another. But primal beginnings must be
things that have a secret and unseen nature that nothing
can thwart or check from its proper being while it combines
to make whatever is being made in the world we see.
Those who propose this theory maintain that the start is in heaven
and heaven's fire which somehow turns itself into air
from the breezes of which is born the water of rain—and from that
earth is created. And then? All things return from earth,
to water, to air, and then to the heat of the first fire.
What they are saying, then, is that this process continues
forever, back and forth, in their path from heaven to earth
and from earth back to the stars of the firmament in heaven.
But first-beginnings by no means ought to behave this way.
It has to be that something abides, always the same,
and that all things should not be emerging and then disappearing,
for whenever a thing changes into something else, or passes
out of its own nature, there is a kind of death
of what it was before. Thus, the famous four
elements we have been discussing are, by this
account, changing and passing away, which means they must
be made of something else, must consist of something that doesn't

have to change. Otherwise, the conclusion we could come to
is that all things return to absolute nothingness.
Better by far to assume that bodies are endowed
with such a nature that they can produce, say, fire, but with
only a few rearrangements, something added or removed,
they can make winds of the air or whatever, interchanging
in a way that comports with reason and what we perceive
around us.
But the counterargument is that we can see how living
things grow into the air from out of the nourishing earth
and need the rain in its proper season from the melting
clouds in the skies above them, where the grateful trees shake
their limbs, now in the rainstorms and now in the heat of
the sun
whose fire fosters them and the crops about them, and beasts
that cannot otherwise grow and thrive. And this is true.
Who can deny that we need solid food to eat
and liquid water to drink, without both of which we should
lose
the flesh that clothes our bones, and our lives would leach
away?
There can be no question that we ourselves are helped
and nourished
by certain fixed things, as others are as well by other
fixed things. There are many first beginnings we all
have in common, commingled in various ways and
nourished
according to their kinds. It is often of great importance
with what and in what relation these first beginnings
cohere

together and how they move and how they receive one another,
for the same beginnings make up the sky, the sea, the earth,
the flowing rivers, the sun overhead, and also our crops,
our trees, and the beasts too—but differently mixed and in different
ways. Look at these lines of mine, with the same letters
arranged in differing patterns to make the words and the phrases,
but sharing the same characters. But the meanings are clear, I hope,
and have different sounds: so, too, can elements mix, the same
units that do not change in an order that always is new.
The elemental parts of the world, the unchanging beginnings
of things, do this as well, producing variety, difference,
so that from them all the various wonders we see are brought forth.

Now let us turn to the subject of Anaxagoras's text,
the *Homoeomeria*.[1] This is the Greek name, clearly, for Latin
does not have the richness of Greek, although one may surely explain
in the words of our mother tongue the ideas that he proposes.
What the *Homoeomeria* says is that bones, for example, are made

1. The Greek means "made up of like parts."

of tiny little bones, and flesh likewise is made
from teeny-weeny bits of flesh, and blood is made
when many little droplets of blood unite together.
Gold, he thinks, consists of many small grains of gold,
and earth is an agglomeration of little earths,
as fire is of tiny fires, and water of drops
of water, and so on and so on. But he does not allow voids
anywhere in things, or place any limits on how
fine things may be cut up. And I think he is just as wrong
as all those others whose views we have taken pains to
present.
His first beginnings are weak and if indeed they are
the primary things endowed with a similar nature to what
they produce, then, like them, they must also suffer change
and pass away, for nothing holds them back from the same
ruin as that which affects their larger complex productions.
How will these things endure under the pressures of nature,
escape from death, and somehow elude the teeth of
destruction?
Fire? Water? Air? Which of these? Or blood
or bone? Not one, I think, when everything is alike.
These beginnings will be as mortal as what we see with our
eyes,
vanquished by the same violence and passing away.
But as we have discussed and I have proved, things cannot
fall away into nothing, as they cannot grow from nothing.
In any event, since food is what nourishes our bodies,
we realize that muscle and bone and veins and blood
are made up of parts that in no way are anything like
themselves,

unless you suppose that foods of all kinds are themselves
made up
of little bodies of sinew and bone and veins and blood,
and that all food and drink is composed of things that are
quite
unlike what they appear, but have in them commingled
flesh and blood and bone and mucus and even pus.
And our food grows out of the earth, which ought to mean
that the earth
is not what we think but consists of things that are somehow
like food.
Apply this logic to other cases and see the results
that are equally strange—that fire and smoke and ashes are
hidden
in wooden logs, which therefore must be unlike themselves
but must consist of things that are altogether different
and arise out of the wood. Whatever bodies the earth
nourishes and makes grow {must consist of unlike things
which in turn contain yet other unlike ingredients.}[2]

To be fair, there is a loophole that Anaxagoras uses
when he supposes that all things are somehow intermingled
and hidden within one another. What appears and we see
is what preponderates and therefore comes to the fore.
But only a little thought will reveal the flaws of this theory,
for if it were true then corn under the crushing weight
of the turning millstone would bleed or reveal one of those
other

2. The lines in curly brackets are missing in the mss. These follow Cyril Bailey's reasonable guess.

substances that nourish and build our bodies. But no,
not a drop of blood oozes onto the miller's floor.
In the same way one could expect from the grass sheep graze on
or else from the water they drink sweet drops of a milk-like substance
that comes from the udders of fleecy ewes. Or from clods of earth,
when you have crumbled them fine, you ought to see small signs
of plants' seeds or leaves. Or when wood is shaved or sanded
there ought to be traces of smoke and ashes and little fires—
but as a plain matter of fact we know that this doesn't happen
and that, instead, there must be seeds, common to all,
and intermingled with all the things that arise from them.
And what could be the possible counterargument? Say
that sometimes on mountaintops in the branches of tall trees
that a strong wind rubs together, flowers of flame will blossom,
and they blaze up together. But is it the "ignis" buried
there in the "lignis," the flame at the heart of all wood?
There are many things that can burn and whose seeds of heat spark
and then burst into flame when they are rubbed together,
and if flame were hidden in all the trees of the woodlands, they

would burst forth to consume the trees and the whole forest.
I have already discussed the importance of how we think
of the first beginnings of things and how they are held
together,
what motions they give and take, and how the same
elements, changed
slightly in their relation, create both fires and trees.
Just as the letters that make the words can change—from fir
to fire—the things they name can also change and be
changed.
What it comes down to is this: if you think that whatever
you see
in the visible world cannot come into being without
some earlier form of similar nature, then it must follow
that the laughter this argument ought to engender will
shake you with great
side-splitting guffaws until, all but helpless, you find
salt tears running down your cheeks and wetting your face.

Now pay attention. I'll try to be clear. I know these things
are difficult and obscure, but I am full of the hope
of fame: it's as if the thyrsus of Dionysus had struck
my mind, even as my love of the Muses urged me onward
to attempt untrodden paths on the heights of their sacred
mountain.
I love to discover fresh springs that nobody else has drunk
from,
to pluck new flowers and weave a chaplet for my brow
from fields where no one has ever ventured before and the
Muses

have never recognized with this token of novel
achievement.
What I'm writing about, after all, is of very high importance
as I proceed to loosen the ligatures of religion.
The subject is also demanding of the clarity only the Muses'
grace can give—which doesn't seem, after all, out of place.
Think of how doctors will give young patients bitter
concoctions
but first touching the rim of the cup with a drop of honey
to try to beguile the lips and the tongue so that the child
may drink down the nasty juice of the wormwood or
whatever,
deluded but not betrayed, for the motive is to do him
good and restore him to health. Just so, it is my intention
to set forth my argument in sweet Pierian song,
touching it with the drops of the Muses' sweetest honey
the better to engage your mind with hexameter verses
so that you may discover the world and how it is made,
and come
to a better understanding of the true nature of things.
We had been talking about how the bodies of matter are
solid,
forever flying about and entirely unimpeded.
Let us now examine the question of whether or not
there is any limit to these pieces of matter, and then
whether there is also a limit to the spaces,
the voids in which the basic bits exist and move.
In other words, what I ask is whether space is finite
or extends forever without measure in height and breadth.
The universe, one must reason, has no external limit,

for if it did then clearly there would have to be something beyond it,
something from which its border was a separation—but that
would also have to be part of the universe. Our reason
tells us, therefore, that beyond the sum of things there cannot
be something else, something further, and we are then forced to conclude
that the universe is without any limit or end, and no matter
what point it may be that you happen to occupy, it is true
that there is, extending in every direction, infinite space.
Or let us consider the question in another way, supposing
that in infinite space some person managed to get to the furthest
limit and then somehow threw a flying lance beyond . . .
Where does it go? Is there any "beyond" or does something block it?
You must choose one or the other, and neither makes any sense,
and compels you, then, to admit that the universe extends
endlessly, for either there is an edge that prevents
the lance from flying further or somehow makes it bounce back,
or else the edge turns out not really to be an edge,
and whatever place you pick as your furthermost limit is not
that at all. It doesn't exist anywhere, and the flight
of the weapon can never escape into even more distant space.

It also stands to reason that if all space stood within
boundaries on all sides with fixed limits, then matter
with its solid weight would have run together, collecting
somewhere
at the bottom, and under heaven's capacious awning nothing
could ever happen—nor could heaven itself exist,
nor even the light of the sun, because all matter would lie
in a dense heap having sunk from the very beginning of
time.
But that hasn't occurred, and won't, and matter does not
come to rest that way, but the world's business keeps on
going with incessant motion in every part
with the elements of matter supplied from infinite space.
We look at the landscape and see how one thing limits
another:
between the hills and mountains is air, and around the sea
there is earth, or if you will, the sea marks the land's end.
But the universe is different, without any outer limit.
Therefore, the extent and the depths of space are so great
that not even quickest lightning bolts can traverse it all
even though they hurtle onwards through endless time,
for no matter how far they go in any direction, they cannot
reduce the length they have yet to travel in endless space.
And nature also withholds any limits from matter
because of the way she requires a body to be surrounded
by void and also demands that the voids be surrounded
by bodies.
It is by this alternation that she makes the universe
infinite, for bodies or voids, without each other,
would by themselves extend without any end or limit.

{If we imagine space as infinite, it could not
contain infinite matter; but if matter itself were finite,}
neither sea nor land nor the shining realms of the sky
nor the race of men, nor even the bodies of gods could
stand
still for the shortest part of an hour—for that hoard
of matter, driven abroad from its union would rush,
dissolved
through the huge void, or rather say that it never could
in the first place have been compacted to any kind of form,
because, scattered so widely, it never could have been
rought together.
It stands to reason that all those first beginnings could not
have placed themselves by design, each knowing where it
went
and each endowed with an intellect, nor did they somehow
agree
what motions they should produce, but because they were
so many
and moving so many ways, they were harried and set into
motion
with infinite collisions so that, in a random way,
having tried every kind of motion and combination, they
came
at last into such arrangements as the sum of things is
made of.
And this is what has lasted through many years and aeons,
for once these elements came together in their compatible
patterns and motions, they produced a system in which
rivers replenish the ever greedy seas with their water,

and earth, in the heat of the sun, renews its generous
yield.
So do the generations of living beings spring up—
which they could by no means do unless there were
somewhere a great
store of matter that rose up from the infinite to replace
in due season whatever is lost. To understand this,
think of how an animal, deprived of food, will starve,
wasting away and losing its body without the supply
of matter. So it is with all things: they dissolve
as soon as they are deprived of matter that is somehow
turned away from its normal course and no longer
provided.
There are also external assaults from every direction,
but these
cannot keep together the whole of each made thing
where the pieces have come together in union, for, though
they smite it,
again and again, and may keep some construction in
place,
yet in the passage of time others arise and the sum
is made good once again. Sometimes the bombarding
atoms may bounce off and give to the first beginnings
the time and space to escape so that they can fly clear
of the combination in which they formerly made up
a part.
And this is how it goes, with things rising up in great
numbers,
and indeed, for the very bombardment of atoms there needs
to be

an infinite supply of matter on every side.
  Now there is a certain theory that some have proposed
    but you,
my dear Memmius, must by all means avoid: it claims
that all things tend to the center and that for this reason
    the world
stands firm and holds together without external buffets,
the highest and lowest as well unable to be set free
because of this constant pressure, this tendency toward
    the middle.
In other words, the world is standing upon itself,
with whatever is beneath the earth pressing upwards to
    find
an equipoise upside down—like images reflected
on the surface of clear water. These people also maintain
that animals there walk somehow with their heads
    downward
and cannot fall from the earth into the sky's heights
any more than our own bodies can fly up into heaven;
and that when they see the sun, we are looking at stars
of the night; and that they share the seasons with us in turn,
just as they have night time when it is bright day for us.
But this is absurd and false, and only the stupid can think
that such twisted reason is plausible and embrace it.
If indeed there really were a middle, could things stand
still there at all, rather than instantly fly away—
for an altogether different reason. All places and spaces,
which we call voids, must yield a passage through that
    middle
(or not-middle) equal to weights, whatever their movements.

Besides, there cannot be a place where bodies arrive
and lose the force of weight, standing still in a void;
nor can a void support anything with weight,
but as its nature commands and desires, it yields place
to bodies. Therefore, things cannot possibly be combined
together in that way, yearning for some middle.
And in any event, they do not suppose that all bodies
press toward the middle that way, but only earth and
water—
the sea's liquid that pours down from the high mountains
and such things as are held within the frame of earth.
But then they try to account for the thin breezes of air
and the flickering tongues of fire that are carried up from
the middle.
And they cannot explain how the sky twinkles with
constellations
and the sun's fire feeds through the blue sky, because all
heat flees from the middle and gathers itself up there.
And what about the tops of the trees that could not sprout
leaves without the food that they get pouring up from the
earth,
supplied by some internal fire. Their reasoning breaks
down . . .
{If fire and air tend to move upward, then there's a danger}
lest the walls of the world are suddenly dissolved
and fly apart after the fashion of flames in a void
with everything else comporting in like manner, the sky's
thunder rushing upwards, and the earth slipping away
from under our feet amid ruin of sky and everything else,
their elements scattering out into an empty abyss

so that in one moment nothing is left behind
but empty space and invisible atoms rushing about,
for in whatever part you assume that these particles first
shall be lacking, that will be the very gate of death
for all things, and that will be how the mass of all
the matter we see around us is dispersed into nothingness.

So, you will gain a most thorough understanding of all
these subtle matters, led on with only a little effort,
for as one thing becomes clear in your mind, it lights
the way
to the next so that night's blindness cannot obscure
your path or prevent your progress as you peer deep into
nature's
depths as each found truth shines the way to the next.