## Hinc laetas urbes pueris florere videmus.

The third proposition states the existence of a *void* in the universe. If there were no void there could be no movement possible. Again take two bodies of the same bulk or cubic contents, the reason for their difference in weight, according to him, is because water contains more void, or air, than the same bulk of iron. This is the modern explanation of the different specific gravity of different substances.

The fourth proposition is that all nature is made up of atoms and void.

The fifth lays down the statement that beyond atoms and the void there is nothing else existent. The gods in whom so many believe are not essential to the universe, they are dependent upon the atoms for their existence. Lucretius does not go so far as to deny their existence, he denies simply the *necessity* of their existence. Lucretius anticipates another modern belief in asserting the existence of other worlds than ours. It is between these worlds in the intermundane spaces that the gods dwell:

The lucid interspace of world and world

Where never creeps a cloud or moves a wind,

Nor ever falls the least white star of snow,

Nor ever lowest roll of thunder moans,

Nor sound of human sorrow mounts to mar

Their sacred everlasting calm.

They are fed by the atoms in their eternal play through the universe and thus they live and thrive; but should the atoms fail to supply them with that which is needed for their sustenance, the gods too would die. What help is therefore to be expected from them? They too are mortal.

Now let us picture to ourselves the Lucretian atom. All matter as we see it is made of a *concilium* or collection of atoms separated from each other by passages or pores which contain void. The less of void there is the greater is the weight of matter. The solidest, hardest, and heaviest matter has in it some void or air. In so far as there is a double nature in it it is liable to destruction. The atoms alone are of single nature and endowed with eternal life because of their solid singleness.

## Solida pollentia simplicitate.

The atom is invisible, eternal, unchangeable in its character, a little hard kernel perfectly solid and indestructible. However matter may be treated, by whatever pressure or force it may be crumbled, or reduced to finest powder, the atom is unaffected. Nothing can affect its eternity or its form. These atoms are as perfect and fresh to-day, says Lucretius, as when the world was new. And with this agrees the latest word of science. Balfour Stewart says, "A simple elementary atom is a truly immortal being and enjoys the privilege of remaining unaltered and unaffected." Thus the atoms are the foundation stones of the universe, amid all the changes of matter they ever remain unbroken and unworn. That this is true may be shown by the chemical analysis of the oldest geological strata of our earth which, though millions of years old, and identically the same in their chemical character with the elementary substances on the shelves of the laboratory.

Lucretius has described the atom as inconceivably small, but even he would have been startled to know the minuteness of the atom as it is known to modern science. Sir William Thomson says that if a drop of water could be magnified to the size of our globe the atoms in it would be of a size varying from that of shot to a billiard ball, and, according to Clerk-Maxwell, two million atoms of hydrogen could be placed in a row one-twenty-fifth of an inch long, and a million million millions of them would not weigh more than 70 grains Troy.

The atom, according to Lucretius, though exceedingly minute, has a limit. Beyond that limit matter cannot be reduced. Exactly to the same effect Clerk-Maxwell savs, "We do not assert that there is an absolute limit to the divisibility of matter; what we assert is, that after we have divided a body into a certain number of constituent parts called molecules, then any further division will destroy the properties of the molecule."

The shapes of the atoms are limited, for if the number of shapes of the atom were infinite the earth would be full of monstrous beings, but the fact that horses beget horses, and barley gives a yield of barley, shows that the variety of the atoms is not very great in respect to form. Some are triangular, others circular, others polygonal.

On the other hand the number of the atoms of whatever shape is unlimited, for there is continual waste going on in the universe. Some things are coming into existence, others full grown, others dving. Things grow when the supply of atoms is greater than the waste; things weaken and die when more atoms pass away than are supplied. As it is with living beings, so it is with the worlds. Stars vanish from the sky because the atoms supplying them have been reduced to a minimum and the loss of atoms bounding away on their unceasing round has been too great. So Lucretius says our world was once very small (and here we have an anticipation of the nebular hypothesis of the universe), but the inrush of atoms gave it increasing size, the day will come when it too will diminish and pass away. Even to-day in our present troubles, social and national, I see, he says, evident signs of the waning life of the world. The earth, he says, is ceasing to bear with its former fertility; it is manifestly grown old. Even his own generation, he thinks,