

than the fact, of everyday experience, that we can by will set into operation a most complicated series of muscles far removed from the brain. Certain movements termed involuntary, such as, for instance, the ciliary movement in the bronchial tubes, do not require an effort on our part, and I have no doubt that many movements occur in the brain which never rise to the horizon of consciousness, and which are independent of our will. But in every case of an intellectual process an exertion is required to be made, and this as an impulse is carried to its destination just as surely and as rapidly, though just as mysteriously, and in detail unconsciously, as the impulse of the will is sent to the fingers of a piano player executing a piece of music *prestissimo*.

The richer the resources of the memory, the more intense the vibrations corresponding to the several parts of the image formed, and the greater the skill and facility required of combining the several parts into a whole, the more brilliant will be the imagination. We may form some estimate of the marvellous capabilities of the imagination when we remember that all the words of all the languages may be built out of some twenty-four letters, that the songs and melodies of all nations consist of combinations of tones comprised in less than eight octaves, and that the multiplicity of the compounds of the chemical laboratory—indeed, as far as we know, of the universe—result from the combinations of some seventy elements.

It is this marvellous power of disintegrating the compounds offered by perception, and stored in memory into its constituent parts, and of recombining them in any manner to a new compound, which renders imagination so valuable. "Chastened by correct observation, it is the keenest detective of truth." This power of the imagination enables the scientist to rise from the visible to the invisible, by transferring the images of the visible into the realm of the invisible—from the fact of what has been observed to the problem of what might be observed. It is this power of the imagination which lays the line of construction through the mathematical figure,