may cause them to open some pores in the brain more than others. Conversely, when one of the pores is opened somewhat more or less than usual by an action of the sensory nerves, this brings about a change in the movement of the spirits and directs them to the muscles which serve to move the body in the way it is usually moved on the occasion of such an action. Thus every movement we make without any contribution from our will – as often happens when we breathe, walk, eat and, indeed, when we perform any action which is common to us and the beasts – depends solely on the arrangement of our limbs and on the route which the spirits, produced by the heat of the heart, follow naturally in the brain, nerves and muscles. This occurs in the same way as the movement of a watch is produced merely by the strength of its spring and the configuration of its wheels.

17. The functions of the soul
Having thus considered all the functions belonging solely to the body, it is easy to recognize that there is nothing in us which we must attribute to our soul except our thoughts. These are of two principal kinds, some being actions of the soul and others its passions. Those I call its actions are all our volitions, for we experience them as proceeding directly from our soul and as seeming to depend on it alone. On the other hand, the various perceptions or modes of knowledge present in us may be called its passions, in a general sense, for it is often not our soul which makes them such as they are, and the soul always receives them from the things that are represented by them.

18. The will
Our volitions, in turn, are of two sorts. One consists of the actions of the soul which terminate in the soul itself, as when we will to love God or, generally speaking, to apply our mind to some object which is not material. The other consists of actions which terminate in our body, as when our merely willing to walk has the consequence that our legs move and we walk.

19. Perception
Our perceptions are likewise of two sorts: some have the soul as their cause, others the body. Those having the soul as their cause are the perceptions of our volitions and of all the imaginings or other thoughts which depend on them. For it is certain that we cannot will anything without thereby perceiving that we are willing it. And although willing
something is an action with respect to our soul, the perception of such
willing may be said to be a passion in the soul. But because this
perception is really one and the same thing as the volition, and names are
always determined by whatever is most noble, we do not normally call it
a ‘passion’, but solely an ‘action’.

344 20. Imaginings and other thoughts formed by the soul
When our soul applies itself to imagine something non-existent – as in
thinking about an enchanted palace or a chimera – and also when it
applies itself to consider something that is purely intelligible and not
imaginable – for example, in considering its own nature – the perceptions
it has of these things depend chiefly on the volition which makes it aware
of them. That is why we usually regard these perceptions as actions
rather than passions.

21. Imaginings which are caused solely by the body
Among the perceptions caused by the body, most of them depend on the
nerves. But there are some which do not and which, like those I have just
described, are called ‘imaginings’. These differ from the others, however,
in that our will is not used in forming them. Accordingly they cannot be
numbered among the actions of the soul, for they arise simply from the
fact that the spirits, being agitated in various different ways and coming
upon the traces of various impressions which have preceded them in the
brain, make their way by chance through certain pores rather than
others. Such are the illusions of our dreams and also the day-dreams we
often have when we are awake and our mind wanders idly without
applying itself to anything of its own accord. Now some of these
imaginings are passions of the soul, taking the word ‘passion’ in its
proper and more exact sense, and all may be regarded as such if the word
is understood in a more general sense. Nonetheless, their cause is not so
conspicuous and determinate as that of the perceptions which the soul
receives by means of the nerves, and they seem to be mere shadows and
pictures of these perceptions. So before we can characterize them
satisfactorily we must consider how these other perceptions differ from
one another.

345 22. How these other perceptions differ from one another
All the perceptions which I have not yet explained come to the soul by
means of the nerves. They differ from one another in so far as we refer
some to external objects which strike our senses, others to our body or to
certain of its parts, and still others to our soul.

23. **The perceptions we refer to objects outside us**
The perceptions we refer to things outside us, namely to the objects of
our senses, are caused by these objects, at least when our judgements are
not false. For in that case the objects produce certain movements in the
organs of the external senses and, by means of the nerves, produce other
movements in the brain, which cause the soul to have sensory perception
of the objects. Thus, when we see the light of a torch and hear the sound
of a bell, the sound and the light are two different actions which, simply
by producing two different movements in some of our nerves, and
through them in our brain, give to the soul two different sensations. And
we refer these sensations to the subjects we suppose to be their causes in
such a way that we think that we see the torch itself and hear the bell, and
not that we have sensory perception merely of movements coming from
these objects.

24. **The perceptions we refer to our body**
The perceptions we refer to our body or to certain of its parts are those of
hunger, thirst and other natural appetites. To these we may add pain,
heat and the other states we feel as being in our limbs, and not as being in
objects outside us. Thus, at the same time and by means of the same
nerves we can feel the cold of our hand and the heat of a nearby flame or,
on the other hand, the heat of our hand and the cold of the air to which it
is exposed. This happens without there being any difference between the
actions which make us feel the heat or cold in our hand and those which
make us feel the heat or cold outside us, except that since one of these
actions succeeds the other, we judge that the first is already in us, and
that its successor is not yet there but in the object which causes it.

25. **The perceptions we refer to our soul**
The perceptions we refer only to the soul are those whose effects we feel
as being in the soul itself, and for which we do not normally know any
proximate cause to which we can refer them. Such are the feelings of joy,
anger and the like, which are aroused in us sometimes by the objects
which stimulate our nerves and sometimes also by other causes. Now all
our perceptions, both those we refer to objects outside us and those we
refer to the various states of our body, are indeed passions with respect to
our soul, so long as we use the term ‘passion’ in its most general sense;
nevertheless we usually restrict the term to signify only perceptions which
refer to the soul itself. And it is only the latter that I have undertaken to explain here under the title ‘passions of the soul’.¹

26. The imaginings which depend solely on the fortuitous movement of the spirits may be passions just as truly as the perceptions which depend on the nerves.

It remains to be noted that everything the soul perceives by means of the nerves may also be represented to it through the fortuitous course of the spirits. The sole difference is that the impressions which come into the brain through the nerves are normally more lively and more definite than those produced there by the spirits — a fact that led me to say in article 21 that the latter are, as it were, a shadow or picture of the former. We must also note that this picture is sometimes so similar to the thing it represents that it may mislead us regarding the perceptions which refer to objects outside us, or even regarding those which refer to certain parts of our body. But we cannot be misled in the same way regarding the passions, in that they are so close and so internal to our soul that it cannot possibly feel them unless they are truly as it feels them to be. Thus often when we sleep, and sometimes even when we are awake, we imagine certain things so vividly that we think we see them before us, or feel them in our body, although they are not there at all. But even if we are asleep and dreaming, we cannot feel sad, or moved by any other passion, unless the soul truly has this passion within it.

27. Definition of the passions of the soul

After having considered in what respects the passions of the soul differ from all its other thoughts, it seems to me that we may define them generally as those perceptions, sensations or emotions of the soul which

¹ The classification given in articles 17–25 may be represented schematically as follows:

Thoughts — actions of the soul (volitions and voluntary imaginings)
  (17)
  passions of the soul in general sense (perceptions)
    (19)
    caused by the soul (perception of volition)
    caused by the body (21)
      neural
        ref. to ext. obj. (23)
      non-neural
        ref. to body (24)
        ref. to soul (passions in restricted sense)
          (25)
we refer particularly to it, and which are caused, maintained and strengthened by some movement of the spirits.

28. Explanation of the first part of this definition
We may call them ‘perceptions’ if we use this term generally to signify all the thoughts which are not actions of the soul or volitions, but not if we use it to signify only evident knowledge. For experience shows that those who are the most strongly agitated by their passions are not those who know them best, and that the passions are to be numbered among the perceptions which the close alliance between the soul and the body renders confused and obscure. We may also call them ‘sensations’, because they are received into the soul in the same way as the objects of the external senses, and they are not known by the soul any differently. But it is even better to call them ‘emotions’ of the soul, not only because this term may be applied to all the changes which occur in the soul – that is, to all the various thoughts which come to it – but more particularly because, of all the kinds of thought which the soul may have, there are none that agitate and disturb it so strongly as the passions.

29. Explanation of the other part of the definition
I add that they refer particularly to the soul, in order to distinguish them from other sensations, some referred to external objects (e.g. smells, sounds and colours) and others to our body (e.g. hunger, thirst and pain). I also add that they are caused, maintained and strengthened by some movement of the spirits, both in order to distinguish them from our volitions (for these too may be called ‘emotions of the soul which refer to it’, but they are caused by the soul itself), and also in order to explain their ultimate and most proximate cause, which distinguishes them once again from other sensations.

30. The soul is united to all the parts of the body conjointly
But in order to understand all these things more perfectly, we need to recognize that the soul is really joined to the whole body, and that we cannot properly say that it exists in any one part of the body to the exclusion of the others. For the body is a unity which is in a sense indivisible because of the arrangement of its organs, these being so related to one another that the removal of any one of them renders the whole body defective. And the soul is of such a nature that it has no relation to extension, or to the dimensions or other properties of the matter of which the body is composed: it is related solely to the whole assemblage of the body’s organs. This is obvious from our inability to conceive of a half or a third of a soul, or of the extension which a soul
occupies. Nor does the soul become any smaller if we cut off some part of the body, but it becomes completely separate from the body when we break up the assemblage of the body’s organs.

31. There is a little gland in the brain where the soul exercises its functions more particularly than in the other parts of the body.

We need to recognize also that although the soul is joined to the whole body, nevertheless there is a certain part of the body where it exercises its functions more particularly than in all the others. It is commonly held that this part is the brain, or perhaps the heart – the brain because the sense organs are related to it, and the heart because we feel the passions as if they were in it. But on carefully examining the matter I think I have clearly established that the part of the body in which the soul directly exercises its functions is not the heart at all, or the whole of the brain. It is rather the innermost part of the brain, which is a certain very small gland situated in the middle of the brain’s substance and suspended above the passage through which the spirits in the brain’s anterior cavities communicate with those in its posterior cavities. The slightest movements on the part of this gland may alter very greatly the course of these spirits, and conversely any change, however slight, taking place in the course of the spirits may do much to change the movements of the gland.

32. How we know that this gland is the principal seat of the soul

Apart from this gland, there cannot be any other place in the whole body where the soul directly exercises its functions. I am convinced of this by the observation that all the other parts of our brain are double, as also are all the organs of our external senses – eyes, hands, ears and so on. But in so far as we have only one simple thought about a given object at any one time, there must necessarily be some place where the two images coming through the two eyes, or the two impressions coming from a single object through the double organs of any other sense, can come together in a single image or impression before reaching the soul, so that they do not present to it two objects instead of one. We can easily understand that these images or other impressions are unified in this gland by means of the spirits which fill the cavities of the brain. But they cannot exist united in this way in any other place in the body except as a result of their being united in this gland.

33. The seat of the passions is not in the heart

As for the opinion of those who think that the soul receives its passions in the heart, this is not worth serious consideration, since it is based solely on the fact that the passions make us feel some change in the heart. It is

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1 The pineal gland; see Treatise on Man, p. 100 above.
easy to see that the only reason why this change is felt as occurring in the heart is that there is a small nerve which descends to it from the brain – just as pain is felt as in the foot by means of the nerves in the foot, and the stars are perceived as in the sky by means of their light and the optic nerves. Thus it is no more necessary that our soul should exercise its functions directly in the heart in order to feel its passions there, than that it should be in the sky in order to see the stars there.

34. How the soul and the body act on each other
Let us therefore take it that the soul has its principal seat in the small gland located in the middle of the brain. From there it radiates through the rest of the body by means of the animal spirits, the nerves, and even the blood, which can take on the impressions of the spirits and carry them through the arteries to all the limbs. Let us recall what we said previously about the mechanism of our body. The nerve-fibres are so distributed in all the parts of the body that when the objects of the senses produce various different movements in these parts, the fibres are occasioned to open the pores of the brain in various different ways. This, in turn, causes the animal spirits contained in these cavities to enter the muscles in various different ways. In this manner the spirits can move the limbs in all the different ways they are capable of being moved. And all the other causes that can move the spirits in different ways are sufficient to direct them into different muscles. To this we may now add that the small gland which is the principal seat of the soul is suspended within the cavities containing these spirits, so that it can be moved by them in as many different ways as there are perceptible differences in the objects. But it can also be moved in various different ways by the soul, whose nature is such that it receives as many different impressions – that is, it has as many different perceptions as there occur different movements in this gland. And conversely, the mechanism of our body is so constructed that simply by this gland’s being moved in any way by the soul or by any other cause, it drives the surrounding spirits towards the pores of the brain, which direct them through the nerves to the muscles; and in this way the gland makes the spirits move the limbs.

35. Example of the way in which the impressions of objects are united in the gland in the middle of the brain
Thus, for example, if we see some animal approaching us, the light reflected from its body forms two images, one in each of our eyes; and these images form two others, by means of the optic nerves, on the internal surface of the brain facing its cavities. Then, by means of the spirits that fill these cavities, the images radiate towards the little gland which the spirits surround: the movement forming each point of one of
the images tends towards the same point on the gland as the movement forming the corresponding point of the other image, which represents the same part of the animal. In this way, the two images in the brain form only one image on the gland, which acts directly upon the soul and makes it see the shape of the animal.

36. Example of the way in which the passions are aroused in the soul
If, in addition, this shape is very strange and terrifying — that is, if it has a close relation to things which have previously been harmful to the body — this arouses the passion of anxiety in the soul, and then that of courage or perhaps fear and terror, depending upon the particular temperament of the body or the strength of the soul, and upon whether we have protected ourselves previously by defence or by flight against the harmful things to which the present impression is related. Thus in certain persons these factors dispose their brain in such a way that some of the spirits reflected from the image formed on the gland proceed from there to the nerves which serve to turn the back and move the legs in order to flee. The rest of the spirits go to nerves which expand or constrict the orifices of the heart, or else to nerves which agitate other parts of the body from which blood is sent to the heart, so that the blood is rarefied in a different manner from usual and spirits are sent to the brain which are adapted for maintaining and strengthening the passion of fear — that is, for holding open or re-opening the pores of the brain which direct the spirits into these same nerves. For merely by entering into these pores they produce in the gland a particular movement which is ordained by nature to make the soul feel this passion. And since these pores are related mainly to the little nerves which serve to contract or expand the orifices of the heart, this makes the soul feel the passion chiefly as if it were in the heart.

37. How all the passions appear to be caused by some movement of the spirits
Something similar happens with all the other passions. That is, they are caused chiefly by the spirits contained in the cavities of the brain making their way to nerves which serve to expand or constrict the orifices of the heart, or to drive blood towards the heart in a distinctive way from other parts of the body, or to maintain the passion in some other way. This makes it clear why I included in my definition of the passions that they are caused by some particular movement of the spirits.

38. Example of movements of the body which accompany the passions and do not depend on the soul
Moreover, just as the course which the spirits take to the nerves of the heart suffices to induce a movement in the gland through which fear
enters the soul, so too the mere fact that some spirits at the same time proceed to the nerves which serve to move the legs in flight causes another movement in the gland through which the soul feels and perceives this action. In this way, then, the body may be moved to take flight by the mere disposition of the organs, without any contribution from the soul.

39. How one and the same cause may excite different passions in different people

The same impression which the presence of a terrifying object forms on the gland, and which causes fear in some people, may excite courage and boldness in others. The reason for this is that brains are not all constituted in the same way. Thus the very same movement of the gland which in some excites fear, in others causes the spirits to enter the pores of the brain which direct them partly into nerves which serve to move the hands in self-defence and partly into those which agitate the blood and drive it towards the heart in the manner required to produce spirits appropriate for continuing this defence and for maintaining the will to do so.

40. The principal effect of the passions

For it must be observed that the principal effect of all the human passions is that they move and dispose the soul to want the things for which they prepare the body. Thus the feeling of fear moves the soul to want to flee, that of courage to want to fight, and similarly with the others.

41. The power of the soul with respect to the body

But the will is by its nature so free that it can never be constrained. Of the two kinds of thought I have distinguished in the soul — the first its actions, i.e. its volitions, and the second its passions, taking this word in its most general sense to include every kind of perception — the former are absolutely within its power and can be changed only indirectly by the body, whereas the latter are absolutely dependent on the actions which produce them, and can be changed by the soul only indirectly, except when it is itself their cause. And the activity of the soul consists entirely in the fact that simply by willing something it brings it about that the little gland to which it is closely joined moves in the manner required to produce the effect corresponding to this volition.

42. How we find in our memory the things we want to remember

Thus, when the soul wants to remember something, this volition makes the gland lean first to one side and then to another, thus driving the
spirits towards different regions of the brain until they come upon the one containing traces left by the object we want to remember. These traces consist simply in the fact that the pores of the brain through which the spirits previously made their way owing to the presence of this object have thereby become more apt than the others to be opened in the same way when the spirits again flow towards them. And so the spirits enter into these pores more easily when they come upon them, thereby producing in the gland that special movement which represents the same object to the soul, and makes it recognize the object as the one it wanted to remember.

361 43. How the soul can imagine, be attentive, and move the body
When we want to imagine something we have never seen, this volition has the power to make the gland move in the way required for driving the spirits towards the pores of the brain whose opening enables the thing to be represented. Again, when we want to fix our attention for some time on some particular object, this volition keeps the gland leaning in one particular direction during that time. And finally, when we want to walk or move our body in some other way, this volition makes the gland drive the spirits to the muscles which serve to bring about this effect.

44. Each volition is naturally joined to some movement of the gland, but through effort or habit we may join it to others
Yet our volition to produce some particular movement or other effect does not always result in our producing it; for that depends on the various ways in which nature or habit has joined certain movements of the gland to certain thoughts. For example, if we want to adjust our eyes to look at a far-distant object, this volition causes the pupils to grow larger; and if we want to adjust them to look at a very near object, this volition makes the pupils contract. But if we think only of enlarging the pupils, we may indeed have such a volition, but we do not thereby enlarge them. For the movement of the gland, whereby the spirits are driven to the optic nerve in the way required for enlarging or contracting the pupils, has been joined by nature with the volition to look at distant or nearby objects, rather than with the volition to enlarge or contract the pupils. Again, when we speak, we think only of the meaning of what we want to say, and this makes us move our tongue and lips much more readily and effectively than if we thought of moving them in all the ways required for uttering the same words. For the habits acquired in learning to speak have made us join the action of the soul (which, by means of the gland, can move the tongue and lips) with the meaning of
the words which follow upon these movements, rather than with the movements themselves.

45. The power of the soul with respect to its passions
Our passions, too, cannot be directly aroused or suppressed by the action of our will, but only indirectly through the representation of things which are usually joined with the passions we wish to have and opposed to the passions we wish to reject. For example, in order to arouse boldness and suppress fear in ourselves, it is not sufficient to have the volition to do so. We must apply ourselves to consider the reasons, objects, or precedents which persuade us that the danger is not great; that there is always more security in defence than in flight; that we shall gain glory and joy if we conquer, whereas we can expect nothing but regret and shame if we flee; and so on.

46. What prevents the soul from having full control over its passions
There is one special reason why the soul cannot readily change or suspend its passions, which is what led me to say in my definition that the passions are not only caused but also maintained and strengthened by some particular movement of the spirits. The reason is that they are nearly all accompanied by some disturbance which takes place in the heart and consequently also throughout the blood and the animal spirits. Until this disturbance ceases they remain present to our mind in the same way as the objects of the senses are present to it while they are acting upon our sense organs. The soul can prevent itself from hearing a slight noise or feeling a slight pain by attending very closely to some other thing, but it cannot in the same way prevent itself from hearing thunder or feeling a fire that burns the hand. Likewise it can easily overcome the lesser passions, but not the stronger and more violent ones, except after the disturbance of the blood and spirits has died down. The most the will can do while this disturbance is at its full strength is not to yield to its effects and to inhibit many of the movements to which it disposes the body. For example, if anger causes the hand to rise to strike a blow, the will can usually restrain it; if fear moves the legs in flight, the will can stop them; and similarly in other cases.

47. The conflicts that are usually supposed to occur between the lower part and the higher part of the soul
All the conflicts usually supposed to occur between the lower part of the soul, which we call ‘sensitive’, and the higher or ‘rational’ part of the soul – or between the natural appetites and the will – consist simply in the
opposition between the movements which the body (by means of its spirits) and the soul (by means of its will) tend to produce at the same time in the gland. For there is within us but one soul, and this soul has within it no diversity of parts: it is at once sensitive and rational too, and all its appetites are volitions. It is an error to identify the different functions of the soul with persons who play different, usually mutually opposed roles – an error which arises simply from our failure to distinguish properly the functions of the soul from those of the body. It is to the body alone that we should attribute everything that can be observed in us to oppose our reason. So there is no conflict here except in so far as the little gland in the middle of the brain can be pushed to one side by the soul and to the other side by the animal spirits (which, as I said above, are nothing but bodies), and these two impulses often happen to be opposed, the stronger cancelling the effect of the weaker. Now we may distinguish two kinds of movement produced in the gland by the spirits. Movements of the first kind represent to the soul the objects which stimulate the senses, or the impressions occurring in the brain; and these have no influence on the will. Movements of the second kind, which do have an influence on the will, cause the passions or the bodily movements which accompany the passions. As to the first, although they often hinder the actions of the soul, or are hindered by them, yet since they are not directly opposed to these actions, we observe no conflict between them. We observe conflict only between movements of the second kind and the volitions which oppose them – for example, between the force with which the spirits push the gland so as to cause the soul to desire something, and the force with which the soul, by its volition to avoid this thing, pushes the gland in a contrary direction. Such a conflict is revealed chiefly through the fact that the will, lacking the power to produce the passions directly (as I have already said), is compelled to make an effort to consider a series of different things, and if one of them happens to have the power to change for a moment the course of the spirits, the next one may happen to lack this power, whereupon the spirits will immediately revert to the same course because no change has occurred in the state of the nerves, heart and blood. This makes the soul feel itself impelled, almost at one and the same time, to desire and not to desire one and the same thing; and that is why it has been thought that the soul has within it two conflicting powers. We may, however, acknowledge a kind of conflict, in so far as the same cause that produces a certain passion in the soul often also produces certain movements in the body, to which the soul makes no contribution and which the soul stops or tries to stop as soon as it perceives them. We experience this when an object that excites fear also causes the spirits to enter the muscles.
which serve to move our legs in flight, while the will to be bold stops
them from moving.

48. How we recognize the strength or weakness of souls, and what is
wrong with the weakest souls
It is by success in these conflicts that each person can recognize the
strength or weakness of his soul. For undoubtedly the strongest souls
belong to those in whom the will by nature can most easily conquer the
passions and stop the bodily movements which accompany them. But
there are some who can never test the strength of their will because they
never equip it to fight with its proper weapons, giving it instead only the
weapons which some passions provide for resisting other passions. What
I call its ‘proper’ weapons are firm and determinate judgements bearing
upon the knowledge of good and evil, which the soul has resolved to
follow in guiding its conduct. The weakest souls of all are those whose
will is not determined in this way to follow such judgements, but
constantly allows itself to be carried away by present passions. The
latter, being often opposed to one another, pull the will first to one side
and then to the other, thus making it battle against itself and so putting
the soul in the most deplorable state possible. Thus, when fear represents
death as an extreme evil which can be avoided only by flight, while
ambition on the other hand depicts the dishonour of flight as an evil
worse than death, these two passions jostle the will in opposite ways; and
since the will obeys first the one and then the other, it is continually
opposed to itself, and so it renders the soul enslaved and miserable.

49. The strength of the soul is inadequate without knowledge of the
truth
It is true that very few people are so weak and irresolute that they choose
only what their passion dictates. Most have some determinate judgemen
ts which they follow in regulating some of their actions. Often these
judgements are false and based on passions by which the will has
previously allowed itself to be conquered or led astray; but because the
will continues to follow them when the passion which caused them is
absent, they may be considered its proper weapons, and we may judge
souls to be stronger or weaker according to their ability to follow these
judgements more or less closely and resist the present passions which are
opposed to them. There is, however, a great difference between the
resolutions which proceed from some false opinion and those which are
based solely on knowledge of the truth. For, anyone who follows the
latter is assured of never regretting or repenting, whereas we always
regret having followed the former when we discover our error.