

and intelligence is but one centrifugal ray darting from the slime to the stars. Thought must execute a metamorphosis; and while this is of course mysterious, it is one of those familiar mysteries, like motion and will, which are more natural than

dialectical lucidity itself; for dialectic grows cogent by fulfilling intent, but intent or meaning is itself vital and inexplicable.

Santayana, *Life of Reason*, I, 3

## 5.2 | *The Senses and Sense Perception*

Whether mind, intellect, or the rational faculty is material or immaterial has long been debated and is still an issue in dispute. The reader will find indications of this controversy in Section 5.1. In contrast, he will find no disagreement here about the bodily or corporeal character of the senses.

From the very beginning of Western psychology, special sense-organs have been the recognized seats of man's power to see, hear, touch, taste, and smell. Modern anatomical and physiological investigations have discovered additional sense-organs and increased our knowledge of such organs as the eye and the ear. In consequence, the traditional enumeration of the five senses has been enlarged to include other modes of sensitivity. But while the study of the senses thus falls within the sphere of anatomy and physiology, the discussion of sensation and sense perception deals with questions that are psychological or philosophical in their basic terms.

For example, all the knowledge we have of the structure and functioning of the sense-organs does not fully explain how sensation takes place; nor does it help us to decide which of several competing theories of sense perception is the best account of that pro-

cess. The reader will find these matters disputed in the quotations below. He will also find the consideration of such questions as the difference between sense-knowledge and intellectual knowledge, the relation of percepts to concepts, and the distinction between primary and secondary qualities; or between such things as size and motion which are perceptible by two or more senses and such things as color which is perceptible by the eye alone, or sound which is perceptible only by the ear.

Another problem that is discussed in a number of quotations is the problem of the trustworthiness and fallibility of the senses and of sense perception. Sensory deceptions, illusions, and hallucinations are often cited by the skeptic to support his case. On the other hand, it is said that the senses themselves make no mistakes; the errors attributed to the senses are errors of judgment, not of sense perception. For the discussion of related matters, the reader is referred to several sections in Chapter 6 on KNOWLEDGE, SECTION 6.2 ON EXPERIENCE, SECTION 6.4 ON ERROR, IGNORANCE, AND THE LIMITS OF HUMAN KNOWLEDGE, and SECTION 6.6 ON DOUBT AND SKEPTICISM.

1 *Timaeus*. Sight in my opinion is the source of the greatest benefit to us, for had we never seen the stars, and the sun, and the heaven, none of the words which we have spoken about the universe would ever have been uttered. But now the sight of day and night, and the months and the revolutions of the years, have created number, and have given us a conception of time, and the power of enquiring about the nature of the universe; and from this source we have derived philosophy, than which no greater good ever was or will be given by the gods to mortal man. This is the greatest boon of sight: and of the lesser benefits why should I speak? even the ordinary man if he were deprived of them would bewail his loss, but in vain. Thus much let me say however: God invented and gave us sight to the end that we might behold the courses of intelligence in the heaven, and apply them to the courses of our own intelligence which are akin to them, the unperturbed to the perturbed; and that we, learning them and partaking of the natural truth of reason, might imitate the absolutely unerring courses of God and regulate our own vagaries. The same may be affirmed of speech and hearing: they have been given by the gods to the same end and for a like reason. For this is the principal end of speech, whereto it most contributes.

Plato, *Timaeus*, 47A

2 *Socrates*. The simple sensations which reach the soul through the body are given at birth to men and animals by nature, but their reflections on the being and use of them are slowly and hardly gained, if they are ever gained, by education and long experience.

*Theaetetus*. Assuredly.

*Soc.* And can a man attain truth who fails of attaining being?

*Theaet.* Impossible.

*Soc.* And can he who misses the truth of anything, have a knowledge of that thing?

*Theaet.* He cannot.

*Soc.* Then knowledge does not consist in impressions of sense, but in reasoning about them; in that only, and not in the mere impression, truth and being can be attained?

*Theaet.* Clearly.

*Soc.* And would you call the two processes by the same name, when there is so great a difference between them?

*Theaet.* That would certainly not be right.

*Soc.* And what name would you give to seeing, hearing, smelling, being cold and being hot?

*Theaet.* I should call all of them perceiving—what other name could be given to them?

*Soc.* Perception would be the collective name of them?

*Theaet.* Certainly.

*Soc.* Which, as we say, has no part in the attainment of truth any more than of being?

*Theaet.* Certainly not.

*Soc.* And therefore not in science or knowledge?

*Theaet.* No.

*Soc.* Then perception, Theaetetus, can never be the same as knowledge or science.

Plato, *Theaetetus*, 186A

3 Scientific knowledge is not possible through the act of perception. Even if perception as a faculty is of 'the such' and not merely of a 'this somewhat', yet one must at any rate actually perceive a 'this somewhat', and at a definite present place and time: but that which is commensurately universal and true in all cases one cannot perceive, since it is not 'this' and it is not 'now'; if it were, it would not be commensurately universal—the term we apply to what is always and everywhere. Seeing, therefore, that demonstrations are commensurately universal and universals imperceptible, we clearly cannot obtain scientific knowledge by the act of perception: nay, it is obvious that even if it were possible to perceive that a triangle has its angles equal to two right angles, we should still be looking for a demonstration—we should not (as some say) possess knowledge of it; for perception must be of a particular, whereas scientific knowledge involves the recognition of the commensurate universal. So if we were on the moon, and saw the earth shutting out the sun's light, we should not know the cause of the eclipse: we should perceive the present fact of the eclipse, but not the reasoned fact at all, since the act of perception is not of the commensurate universal. I do not, of course, deny that by watching the frequent recurrence of this event we might, after tracking the commensurate universal, possess a demonstration for the commensurate universal is elicited from the several groups of singulars.

The commensurate universal is precious because it makes clear the cause; so that in the case of facts like these which have a cause other than themselves universal knowledge is more precious than sense-perceptions and than intuition. (As regards primary truths there is of course a different account to be given.) Hence it is clear that knowledge of things demonstrable cannot be acquired by perception, unless the term perception is applied to the possession of scientific knowledge through demonstration. Nevertheless certain points do arise with regard to connexions to be proved which are referred for their explanation to a failure in sense-perception: there are cases when an act of vision would terminate our inquiry, not because in seeing we should be knowing, but because we should have elicited the universal from seeing; if, for example, we saw the pores in the glass and the light passing through, the reason of the kindling would be clear to us because we should at the same time see it in each instance and intuit that it must be so in all instances.

Aristotle, *Posterior Analytics*, 87<sup>b</sup>27

4 The following results applying to any and every sense may now be formulated.

(A) By a 'sense' is meant what has the power of receiving into itself the sensible forms of things without the matter. This must be conceived of as taking place in the way in which a piece of wax takes on the impress of a signet-ring without the iron or gold; we say that what produces the impression is a signet of bronze or gold, but its particular metallic constitution makes no difference: in a similar way the sense is affected by what is coloured or flavoured or sounding, but it is indifferent what in each case the *substance* is; what alone matters is what *quality* it has, i.e. in what *ratio* its constituents are combined.

(B) By 'an organ of sense' is meant that in which ultimately such a power is seated.

The sense and its organ are the same in fact, but their essence is not the same. What perceives is, of course, a spatial magnitude, but we must not admit that either the having the power to perceive or the sense itself is a magnitude; what they are is a certain ratio or power *in* a magnitude. This enables us to explain why objects of sense which possess one of two opposite sensible qualities in a degree largely in excess of the other opposite destroy the organs of sense; if the movement set up by an object is too strong for the organ, the equipoise of contrary qualities in the organ, which just *is* its sensory power, is disturbed; it is precisely as concord and tone are destroyed by too violently twanging the strings of a lyre. This explains also why plants cannot perceive, in spite of their having a portion of soul in them and obviously being affected by tangible objects themselves; for undoubtedly their temperature can be lowered or raised. The explanation is that they have no mean of contrary qualities, and so no principle in them capable of taking on the forms of sensible objects without their matter; in the case of plants the affection is an affection by form-and-matter together. The problem might be raised: Can what cannot smell be said to be affected by smells or what cannot see by colours, and so on? It might be said that a smell is just what can be smelt, and if it produces any effect it can only be so as to make something smell it, and it might be argued that what cannot smell cannot be affected by smells and further that what can smell can be affected by it only in so far as it has in it the power to smell (similarly with the proper objects of all the other senses). Indeed that this *is* so is made quite evident as follows. Light or darkness, sounds and smells leave *bodies* quite unaffected; what does affect bodies is not these but the bodies which are their vehicles, e.g. what splits the trunk of a tree is not the sound of the thunder but the air which accompanies thunder. Yes, but, it may be objected, bodies are affected by what is tangible and by flavours. If not, by what are things that are without soul affected, i.e. altered in quality? Must we

not, then, admit that the objects of the other senses also may affect them? Is not the true account this, that all bodies *are* capable of being affected by smells and sounds, but that some on being acted upon, having no boundaries of their own, disintegrate, as in the instance of air, which does become odorous, showing that *some* effect is produced on it by what is odorous? But smelling is more than such an affection by what is odorous—*what* more? Is not the answer that, while the air owing to the momentary duration of the action upon it of what is odorous does itself become perceptible to the sense of smell, smelling is an *observing* of the result produced?

Aristotle, *On the Soul*, 424<sup>a</sup>16

5 Without touch there can be no other sense, and the organ of touch cannot consist of earth or of any other single element.

It is evident, therefore, that the loss of this one sense alone must bring about the death of an animal. For as on the one hand nothing which is not an animal can have this sense, so on the other it is the only one which is indispensably necessary to what is an animal. This explains, further, the following difference between the other senses and touch. In the case of all the others excess of intensity in the qualities which they apprehend, i.e. excess of intensity in colour, sound, and smell, destroys not the animal but only the organs of the sense (except incidentally, as when the sound is accompanied by an impact or shock, or where through the objects of sight or of smell certain other things are set in motion, which destroy by contact); flavour also destroys only in so far as it is at the same time tangible. But excess of intensity in tangible qualities, e.g. heat, cold, or hardness, destroys the animal itself. As in the case of every sensible quality excess destroys the organ, so here what is tangible destroys touch, which is the essential mark of life; for it has been shown that without touch it is impossible for an animal to be. That is why excess in intensity of tangible qualities destroys not merely the organ, but the animal itself, because this is the only sense which it must have.

All the other senses are necessary to animals, as we have said, not for their being, but for their well-being. Such, e.g. is sight, which, since it lives in air or water, or generally in what is pellucid, it must have in order to see, and taste because of what is pleasant or painful to it, in order that it may perceive these qualities in its nutriment and so may desire to be set in motion, and hearing that it may have communication made to it, and a tongue that it may communicate with its fellows.

Aristotle, *On the Soul*, 435<sup>b</sup>2

6 Since a particular figure felt by the hands in the dark is known to be the same which is seen in the

bright light of day, touch and sight must be excited by a quite similar cause. Well then if we handle a square thing and it excites our attention in the dark, in the daylight what square thing will be able to fall on our sight, except the image of that thing? Therefore the cause of seeing, it is plain, lies in images and no thing can be perceived without them.

Well the idols of things I speak of are borne along all round and are discharged and transmitted in all directions; but because we can see with the eyes alone, the consequence is that, to whatever point we turn our sight, there all the several things meet and strike it with their shape and colour. And the image gives the power to see and the means to distinguish how far each thing is distant from us; for as soon as ever it is discharged, it pushes before it and impels all the air which lies between it and the eyes; and thus that air all streams through our eyes and brushes so to say the pupils and so passes through. The consequence is that we see how far distant each thing is. And the greater the quantity of air which is driven on before it and the larger the current which brushes our eyes, the more distant each different thing is seen to be. You must know these processes go on with extreme rapidity, so that at one and the same moment we see what like a thing is and how far distant it is. And this must by no means be deemed strange herein that, while the idols which strike the eyes cannot be seen one at a time, the things themselves are seen. For thus when the wind too beats us with successive strokes and when piercing cold streams, we are not wont to feel each single particle of that wind and cold, but rather the whole result; and then we perceive blows take effect on our body just as if something or other were beating it and giving us a sensation of its body outside. Again when we thump a stone with a finger, we touch merely the outermost colour on the surface of the stone, and yet we do not feel that colour by our touch, but rather we feel the very hardness of the stone seated in its inmost depths.

Lucretius, *Nature of Things*, IV

- 7 You will find that from the senses first has proceeded the knowledge of the true and that the senses cannot be refuted. For that which is of itself to be able to refute things false by true things must from the nature of the case be proved to have the higher certainty. Well then what must fairly be accounted of higher certainty than sense? Shall reason founded on false sense be able to contradict them, wholly founded as it is on the senses? And if they are not true, then all reason as well is rendered false. Or shall the ears be able to take the eyes to task, or the touch the ears? Again shall the taste call in question this touch, or the nostrils refute or the eyes controvert it? Not so, I guess; for each apart has its own distinct office, each its own

power; and therefore we must perceive what is soft and cold or hot by one distinct faculty, by another perceive the different colours of things and thus see all objects which are conjoined with colour. Taste too has its faculty apart; smells spring from one source, sounds from another. It must follow therefore that any one sense cannot confute any other. No nor can any sense take itself to task, since equal credit must be assigned to it at all times. What therefore has at any time appeared true to each sense, is true. And if reason shall be unable to explain away the cause why things which close at hand were square, at a distance looked round, it yet is better, if you are at a loss for the reason, to state erroneously the causes of each shape, than to let slip from your grasp on any side things manifest and ruin the groundwork of belief and wrench up all the foundations on which rest life and existence. For not only would all reason give way, life itself would at once fall to the ground, unless you choose to trust the senses and shun precipices and all things else of this sort that are to be avoided, and to pursue the opposite things. All that host of words then be sure is quite unmeaning, which has been drawn out in array against the senses.

Lucretius, *Nature of Things*, IV

- 8 When therefore we force these voices forth from the depths of our body and discharge them straight out at the mouth, the pliant tongue deft fashioner of words gives them articulate utterance and the structure of the lips does its part in shaping them. Therefore when the distance is not long between the point from which each several voice has started and that at which it arrives, the very words too must be plainly heard and distinguished syllable by syllable; for each voice retains its structure and retains its shape. But if the space between be more than is suitable, the words must be huddled together in passing through much air and the voice be disorganised in its flight through the same. Therefore it is that you can hear a sound, yet cannot distinguish what the meaning of the words is: so huddled and hampered is the voice when it comes.

Lucretius, *Nature of Things*, IV

- 9 Now mark me, and I will discuss the way in which the contact of smell affects the nostrils: and first there must be many things from which a varied flow of smells streams and rolls on; and we must suppose that they thus stream and discharge and disperse themselves among all things alike; but one smell fits itself better to one creature, another to another on account of their unlike shapes; and therefore bees are drawn on by the smell of honey through the air to a very great distance, and so are vultures by carcasses.

Lucretius, *Nature of Things*, IV

10 All sense-perception can occur only through the medium of some bodily substance, since in the absence of body the soul is utterly absorbed in the Intellectual Sphere. Sense-perception being the gripping not of the Intellectual but of the sensible alone, the soul, if it is to form any relationship of knowledge, or of impression, with objects of sense, must be brought in some kind of contact with them by means of whatever may bridge the gap.

The knowledge, then, is realized by means of bodily organs.

Plotinus, *Fourth Ennead*, V, 1

11 Our fleshly sense is slow because it is fleshly sense: and that is the limit of its being. It can do what it was made to do; but it has no power to hold things transient as they run their course from their due beginning to their due end. For in Your word, by which they are created, they hear their law: "From this point: not beyond that."

Augustine, *Confessions*, IV, 10

12 Whatever things you perceive by fleshly sense you perceive only in part, not knowing the whole of which those things are but parts and yet they delight you so much. For if fleshly sense had been capable of grasping the whole—and had not for your punishment received part only of the whole as its just limit—you would wish that whatever exists in the present might pass on, that the whole might be perceived by you for your delight. What we speak, you hear by a bodily sense: and certainly you do not wish the same syllable to go on sounding but to pass away that other syllables may come and you may hear the whole speech. It is always so with all things that go to make up one whole: all that goes to make up the whole does not exist at one moment. If all could be perceived in one act of perception, it would obviously give more delight than any of the individual parts.

Augustine, *Confessions*, IV, 11

13 As far as regards the doctrine which treats of . . . rational philosophy, far be it from us to compare them [the Platonists] with those who attributed to the bodily senses the faculty of discriminating truth, and thought, that all we learn is to be measured by their untrustworthy and fallacious rules. . . . Such . . . were the Stoics, who ascribed to the bodily senses that expertness in disputation which they so ardently love, called by them dialectic, asserting that from the senses the mind conceives the notions of those things which they explicate by definition. And hence is developed the whole plan and connection of their learning and teaching. I often wonder, with respect to this, how they can say that none are beautiful but the wise; for by what bodily sense have they perceived that beauty, by what eyes of the flesh have they seen wisdom's comeliness of form? Those, however, whom we justly rank before all others, have distin-

guished those things which are conceived by the mind from those which are perceived by the senses, neither taking away from the senses anything to which they are competent, nor attributing to them anything beyond their competency.

Augustine, *City of God*, VIII, 7

14 The intellectual soul . . . in the order of nature, holds the lowest place among intellectual substances; for it is not naturally gifted with the knowledge of truth, as the angels are, but has to gather knowledge from individual things by way of the senses. . . . But nature never fails in necessary things; therefore the intellectual soul had to be endowed not only with the power of understanding, but also with the power of feeling. Now the action of the senses is not performed without a corporeal instrument. Therefore the intellectual soul had to be united to a body which could be an adequate organ of sense.

Now all the other senses are based on the sense of touch. But the organ of touch has to be a medium between contraries, such as hot and cold, wet and dry, and the like, of which the sense of touch has the perception; thus it is in potency with regard to contraries, and is able to perceive them. Therefore the more the organ of touch is reduced to an even temperament, the more sensitive will be the touch. But the intellectual soul has the power of sense in all its completeness, because what belongs to the inferior nature pre-exists more perfectly in the superior. . . . Therefore the body to which the intellectual soul is united should be a mixed body, above all others reduced to the most even temperament. For this reason among animals man has the best sense of touch. And among men, those who have the best sense of touch have the best intellect. A sign of this is that we observe *those who are refined in body are well endowed in mind*, as stated in the book on the *Soul*.

Aquinas, *Summa Theologica*, I, 76, 5

15 The proper sense judges of the proper sensible by discerning it from other things which come under the same sense; for instance, by discerning white from black or green. But neither sight nor taste can discern white from sweet, because what discerns between two things must know both. Therefore the discerning judgment must be assigned to the common sense, to which, as to a common term, all apprehensions of the senses must be referred, and by which, again, all the intentions of the senses are perceived; as when someone sees that he sees. For this cannot be done by the proper sense, which only knows the form of the sensible by which it is changed, in which change the action of sight is completed, and from which change follows another in the common sense which perceives the act of vision.

Aquinas, *Summa Theologica*, I, 78, 4

- 16 Although the operation of the intellect has its origin in the senses, yet, in the thing apprehended through the senses, the intellect knows many things which the senses cannot perceive.

Aquinas, *Summa Theologica*, I, 78, 4

- 17 Our intellect's proper and proportionate object is the nature of a sensible thing. Now a perfect judgment concerning anything cannot be formed, unless all that pertains to that thing is known; especially if that which is the term and end of judgment is not known. . . . Now it is clear that a smith cannot judge perfectly of a knife unless he knows the work that must be done, and in like manner the natural philosopher cannot judge perfectly of natural things unless he knows sensible things. But in the present state of life whatever we understand we know by comparison to natural sensible things. Consequently it is not possible for our intellect to form a perfect judgment while the senses are suspended, through which sensible things are known to us.

Aquinas, *Summa Theologica*, I, 84, 8

- 18 This same deception that the senses convey to our understanding they receive in their turn. Our soul at times takes a like revenge; they compete in lying and deceiving each other. What we see and hear when stirred with anger, we do not hear as it is. . . . The object that we love seems to us more beautiful than it is. . . . and uglier the one that we loathe. To a man vexed and afflicted the brightness of the day seems darkened and gloomy. Our senses are not only altered, but often completely stupefied by the passions of the soul. How many things we see which we do not notice if our mind is occupied elsewhere! . . . It seems as though the soul draws the powers of the senses inward and occupies them. Thus both the inside and the outside of man is full of weakness and falsehood.

Montaigne, *Essays*, II, 12, Apology for Raymond Sebond

- 19 To judge the appearances that we receive of objects, we would need a judicatory instrument; to verify this instrument, we need a demonstration; to verify the demonstration, an instrument: there we are in a circle.

Since the senses cannot decide our dispute, being themselves full of uncertainty, it must be reason that does so. No reason can be established without another reason: there we go retreating back to infinity.

Our conception is not itself applied to foreign objects, but is conceived through the mediation of the senses; and the senses do not comprehend the foreign object, but only their own impressions. And thus the conception and semblance we form is not of the object, but only of the impression and effect made on the sense; which impression and the object are different things. Wherefore whoever

judges by appearances judges by something other than the object.

And for saying that the impressions of the senses convey to the soul the quality of the foreign objects by resemblance, how can the soul and understanding make sure of this resemblance, having of itself no communication with foreign objects? Just as a man who does not know Socrates, seeing his portrait, cannot say that it resembles him.

Now if anyone should want to judge by appearances anyway, to judge by all appearances is impossible, for they clash with one another by their contradictions and discrepancies, as we see by experience. Shall some selected appearances rule the others? We shall have to verify this selection by another selection, the second by a third; and thus it will never be finished. . . .

Finally, there is no existence that is constant, either of our being or of that of objects. And we, and our judgment, and all mortal things go on flowing and rolling unceasingly. Thus nothing certain can be established about one thing by another, both the judging and the judged being in continual change and motion.

Montaigne, *Essays*, II, 12, Apology for Raymond Sebond

- 20 The senses . . . are very sufficient to certify and report truth, though not always immediately, yet by comparison, by help of instrument, and by producing and urging such things as are too subtle for the sense to some effect comprehensible by the sense.

Bacon, *Advancement of Learning*, Bk. II, XIII, 4

- 21 Many experiences little by little destroyed all the faith which I had rested in my senses; for I from time to time observed that those towers which from afar appeared to me to be round, more closely observed seemed square, and that colossal statues raised on the summit of these towers, appeared as quite tiny statues when viewed from the bottom; and so in an infinitude of other cases I found error in judgments founded on the external senses. And not only in those founded on the external senses, but even in those founded on the internal as well; for is there anything more intimate or more internal than pain? And yet I have learned from some persons whose arms or legs have been cut off, that they sometimes seemed to feel pain in the part which had been amputated, which made me think that I could not be quite certain that it was a certain member which pained me, even although I felt pain in it. And to those grounds of doubt I have lately added two others, which are very general; the first is that I never have believed myself to feel anything in waking moments which I cannot also sometimes believe myself to feel when I sleep, and as I do not

think that these things which I seem to feel in sleep, proceed from objects outside of me, I do not see any reason why I should have this belief regarding objects which I seem to perceive while awake. The other was that being still ignorant, or rather supposing myself to be ignorant, of the author of my being, I saw nothing to prevent me from having been so constituted by nature that I might be deceived even in matters which seemed to me to be most certain. And as to the grounds on which I was formerly persuaded of the truth of sensible objects, I had not much trouble in replying to them. For since nature seemed to cause me to lean towards many things from which reason repelled me, I did not believe that I should trust much to the teachings of nature. And although the ideas which I receive by the senses do not depend on my will, I did not think that one should for that reason conclude that they proceeded from things different from myself, since possibly some faculty might be discovered in me—though hitherto unknown to me—which produced them.

But now that I begin to know myself better, and to discover more clearly the author of my being, I do not in truth think that I should rashly admit all the matters which the senses seem to teach us, but, on the other hand, I do not think that I should doubt them all universally.

Descartes, *Meditations on First Philosophy*, VI

22 In order rightly to see what amount of certainty belongs to sense we must distinguish three grades as falling within it. To the first belongs the immediate affection of the bodily organ by external objects; and this can be nothing else than the motion of the particles of the sensory organs and the change of figure and position due to that motion. The second comprises the immediate mental result, due to the mind's union with the corporeal organ affected; such are the perceptions of pain, of pleasurable stimulation, of thirst, of hunger, of colours, of sound, savour, odour, cold, heat, and the like, which . . . arise from the union and, as it were, the intermixture of mind and body. Finally, the third contains all those judgments which, on the occasion of motions occurring in the corporeal organ, we have from our earliest years been accustomed to pass about things external to us.

For example, when I see a staff, it is not to be thought that *intentional species* fly off from it and reach the eye, by merely that rays of light reflected from the staff excite certain motions in the optic nerve and, but its mediation, in the brain as well. . . . It is in this cerebral motion, which is common to us and to the brutes, that the first grade of perception consists. But from this the second grade of perception results; and that merely extends to the perception of the colour or light reflected from the stick, and is due to the fact that the mind is so intimately conjoined with the brain

as to be affected by the motions arising in it. Nothing more than this should be assigned to sense, if we wish to distinguish it accurately from the intellect. For though my judgment that there is a staff situated without me, which judgment results from the sensation of colour by which I am affected, and likewise my reasoning from the extension of that colour, its boundaries, and its position relatively to the parts of my brain, to the size, the shape, and the distance of the said staff, are vulgarly assigned to sense, and are consequently here referred to the third grade of sensation, they clearly depend upon the understanding alone. . . . Magnitude, distance and figure can be perceived by reasoning alone, which deduces them one from another. . . .

From this it is clear that when we say that *the certitude obtainable by the understanding is much greater than that attaching to the senses* the meaning of those words is, that those judgments which when we are in full maturity new observations have led us to make, are surer than those we have formed in early infancy and apart from all reflection; and this is certainly true. For it is clear that here there is no question of the first or second grade of sense-perception, because in them no falsity can reside. When, therefore, it is alleged that refraction makes a staff appear broken in the water, it is the same as if it were said that it appears to us in the same way as it would to an infant who judged that it was broken, and as it does even to us who, owing to the prejudices to which we from our earliest years have grown accustomed, judge in the same way. . . . Hence, in this instance, it is the understanding solely which corrects the error of sense; and no case can ever be adduced in which error results from our trusting the operation of the mind more than sense.

Descartes, *Objections and Replies*, VI

23 There is no conception in a man's mind which hath not at first, totally or by parts, been begotten upon the organs of sense. The rest are derived from that original. . . .

The cause of sense is the external body, or object, which presseth the organ proper to each sense, either immediately, as in the taste and touch; or mediately, as in seeing, hearing, and smelling: which pressure, by the mediation of nerves and other strings and membranes of the body, continued inwards to the brain and heart, causeth there a resistance, or counter-pressure, or endeavour of the heart to deliver itself: which endeavour, because outward, seemeth to be some matter without. And this seeming, or fancy, is that which men call *sense*; and consisteth, as to the eye, in a light, or colour figured; to the ear, in a sound; to the nostril, in an odour; to the tongue and palate, in a savour; and to the rest of the body, in heat, cold, hardness, softness, and such other qualities as we discern by feeling. All which qualities

called *sensible* are in the object that causeth them but so many several motions of the matter, by which it presseth our organs diversely. Neither in us that are pressed are they anything else but diverse motions (for motion produceth nothing but motion). But their appearance to us is fancy, the same waking that dreaming. And as pressing, rubbing, or striking the eye makes us fancy a light, and pressing the ear produceth a din; so do the bodies also we see, or hear, produce the same by their strong, though unobserved action. For if those colours and sounds were in the bodies or objects that cause them, they could not be severed from them, as by glasses and in echoes by reflection we see they are: where we know the thing we see is in one place; the appearance, in another. And though at some certain distance the real and very object seem invested with the fancy it begets in us; yet still the object is one thing, the image or fancy is another. So that sense in all cases is nothing else but original fancy caused (as I have said) by the pressure that is, by the motion of external things upon our eyes, ears, and other organs, thereunto ordained.

Hobbes, *Leviathan*, I, 1

- 24 The homogeneal light and rays which appear red, or rather make objects appear so, I call rubrific or red-making; those which make objects appear yellow, green, blue, and violet, I call yellow-making, green-making, blue-making, violet-making, and so of the rest. And if at any time I speak of light and rays as coloured or endued with colours, I would be understood to speak not philosophically and properly, but grossly, and accordingly to such conceptions as vulgar people in seeing all these experiments would be apt to frame. For the rays, to speak properly, are not coloured. In them there is nothing else than a certain power and disposition to stir up a sensation of this or that colour. For as sound in a bell or musical string, or other sounding body, is nothing but a trembling motion, and in the air nothing but that motion propagated from the object, and in the sensorium 'tis a sense of that motion under the form of sound; so colours in the object are nothing but a disposition to reflect this or that sort of rays more copiously than the rest; in the rays they are nothing but their dispositions to propagate this or that motion into the sensorium, and in the sensorium they are sensations of those motions under the forms of colours.

Newton, *Optics*, I, 2

- 25 We might get to know the beauty of the universe in each soul, if we could unfold all that is enfolded in it and that is perceptibly developed only through time. But as each distinct perception of the soul includes an infinite number of confused perceptions, which involve the whole universe, the

soul itself knows the things of which it has perception, only in so far as it has distinct and heightened [or unveiled] perceptions of them; and it has perfection in proportion to its distinct perceptions. Each soul knows the infinite, knows all, but confusedly; as when I walk on the sea-shore and hear the great noise the sea makes, I hear the particular sounds which come from the particular waves and which make up the total sound, but I do not discriminate them from one another. Our confused perceptions are the result of the impressions which the whole universe makes upon us.

Leibniz, *Principles of Nature and of Grace*, 13

- 26 The next thing to be considered is, how bodies produce ideas in us; and that is manifestly by impulse, the only way which we can conceive bodies to operate in.

If then external objects be not united to our minds when they produce ideas therein; and yet we perceive these *original* qualities in such of them as singly fall under our senses, it is evident that some motion must be thence continued by our nerves, or animal spirits, by some parts of our bodies, to the brains or the seat of sensation, there to produce in our minds the particular ideas we have of them. And since the extension, figure, number, and motion of bodies of an observable bigness, may be perceived at a distance by the sight, it is evident some singly imperceptible bodies must come from them to the eyes, and thereby convey to the brain some motion; which produces these ideas which we have of them in us.

After the same manner that the ideas of these original qualities are produced in us, we may conceive that the ideas of *secondary* qualities are also produced, viz. by the operation of insensible particles on our senses. For, it being manifest that there are bodies and good store of bodies, each whereof are so small, that we cannot by any of our senses discover either their bulk, figure, or motion,—as is evident in the particles of the air and water, and others extremely smaller than those; perhaps as much smaller than the particles of air and water, as the particles of air and water are smaller than peas or hail-stones;—let us suppose at present that the different motions and figures, bulk and number, of such particles, affecting the several organs of our senses, produce in us those different sensations which we have from the colours and smells of bodies; v.g. that a violet, by the impulse of such insensible particles of matter, of peculiar figures and bulks, and in different degrees and modifications of their motions, causes the ideas of the blue colour, and sweet scent of that flower to be produced in our minds. It being no more impossible to conceive that God should annex such ideas to such motions, with which they have no similitude, than that he should annex the idea of pain to the



motion of a piece of steel dividing our flesh, with which that idea hath no resemblance.

What I have said concerning colours and smells may be understood also of tastes and sounds, and other the like sensible qualities; which, whatever reality we by mistake attribute to them, are in truth nothing in the objects themselves, but powers to produce various sensations in us; and depend on those primary qualities, viz. bulk, figure, texture, and motion of parts as I have said.

Locke, *Concerning Human Understanding*,  
Bk. II, VIII, 11–14

- 27 It is for want of reflection that we are apt to think that our senses show us nothing but material things. Every act of sensation, when duly considered, gives us an equal view of both parts of nature, the corporeal and spiritual. For whilst I know, by seeing or hearing, etc., that there is some corporeal being without me, the object of that sensation, I do more certainly know, that there is some spiritual being within me that sees and hears. This, I must be convinced, cannot be the action of bare insensible matter; nor ever could be, without an immaterial thinking being.

Locke, *Concerning Human Understanding*,  
Bk. II, XXIII, 15

- 28 I find I can excite ideas in my mind at pleasure, and vary and shift the scene as oft as I think fit. It is no more than willing, and straightway this or that idea arises in my fancy; and by the same power it is obliterated and makes way for another. This making and unmaking of ideas doth very properly denominate the mind active. Thus much is certain and grounded on experience; but when we think of unthinking agents or of exciting ideas exclusive of volition, we only amuse ourselves with words.

But, whatever power I may have over my own thoughts, I find the ideas actually perceived by Sense have not a like dependence on my will. When in broad daylight I open my eyes, it is not in my power to choose whether I shall see or no, or to determine what particular objects shall present themselves to my view; and so likewise as to the hearing and other senses; the ideas imprinted on them are not creatures of my will. There is therefore some *other* Will or Spirit that produces them.

Berkeley, *Principles of Human Knowledge*, 28–29

- 29 The ideas imprinted on the Senses by the Author of nature are called *real things*; and those excited in the imagination being less regular, vivid, and constant, are more properly termed *ideas*, or *images of things*, which they copy and represent. But then our sensations, be they never so vivid and distinct, are nevertheless ideas, that is, they exist in the mind, or are perceived by it, as truly as the ideas

of its own framing. The ideas of Sense are allowed to have more reality in them, that is, to be more strong, orderly, and coherent than the creatures of the mind; but this is no argument that they exist without the mind. They are also less dependent on the spirit, or thinking substance which perceives them, in that they are excited by the will of another and more powerful spirit; yet still they are *ideas*, and certainly no idea, whether faint or strong, can exist otherwise than in a mind perceiving it. . . .

I do not argue against the existence of any one thing that we can apprehend either by sense or reflexion. That the things I see with my eyes and touch with my hands do exist, really exist, I make not the least question. The only thing whose existence we deny is that which *philosophers* call Matter or corporeal substance. And in doing of this there is no damage done to the rest of mankind, who, I dare say, will never miss it. . . . If the word *substance* be taken in the vulgar sense—for a combination of sensible qualities, such as extension, solidity, weight, and the like—this we cannot be accused of taking away: but if it be taken in a philosophic sense—for the support of accidents or qualities without the mind—then indeed I acknowledge that we take it away, if one may be said to take away that which never had any existence, not even in the imagination. . . . Since therefore the objects of sense exist only in the mind, and are withal thoughtless and inactive, I chose to mark them by the word *idea*, which implies those properties.

But, say what we can, some one perhaps may be apt to reply, he will still believe his senses, and never suffer any arguments, how plausible soever, to prevail over the certainty of them. Be it so; assert the evidence of sense as high as you please, we are willing to do the same. That what I see, hear, and feel doth exist, that is to say, is perceived by me, I no more doubt than I do of my own being. But I do not see how the testimony of sense can be alleged as a proof for the existence of anything which is not perceived by sense. We are not for having any man turn sceptic and disbelieve his senses; on the contrary, we give them all the stress and assurance imaginable. . . .

*Secondly*, it will be objected that there is a great difference betwixt real fire for instance, and the idea of fire, betwixt dreaming or imagining oneself burnt, and actually being so: if you suspect it to be only the idea of fire which you see, do but put your hand into it and you will be convinced with a witness. This and the like may be urged in opposition to our tenets. To all which the answer is evident from what hath been already said; and I shall only add in this place, that if real fire be very different from the idea of fire, so also is the real pain that it occasions very different from the idea of the same pain, and yet nobody will pretend that real pain either is, or can possibly be, in

an unperceiving thing, or without the mind, any more than its idea.

Berkeley, *Principles of Human Knowledge*, 33-41

30 It seems evident, that men are carried, by a natural instinct or prepossession, to repose faith in their senses; and that, without any reasoning, or even almost before the use of reason, we always suppose an external universe, which depends not on our perception, but would exist, though we and every sensible creature were absent or annihilated. Even the animal creation are governed by a like opinion, and preserve this belief of external objects, in all their thoughts, designs, and actions.

It seems also evident, that, when men follow this blind and powerful instinct of nature, they always suppose the very images, presented by the senses, to be the external objects, and never entertain any suspicion, that the one are nothing but representations of the other. This very table which we see white, and which we feel hard, is believed to exist, independent of our perception, and to be something external to our mind, which perceives it. Our presence bestows not being on it: our absence does not annihilate it. It preserves its existence uniform and entire, independent of the situation of intelligent beings, who perceive or contemplate it.

But this universal and primary opinion of all men is soon destroyed by the slightest philosophy, which teaches us, that nothing can ever be present to the mind but an image or perception, and that the senses are only the inlets, through which these images are conveyed, without being able to produce any immediate intercourse between the mind and the object. The table, which we see, seems to diminish, as we remove farther from it: but the real table, which exists independent of us, suffers no alteration: it was, therefore, nothing but its image, which was present to the mind. These are the obvious dictates of reason; and no man, who reflects, ever doubted, that the existences, which we consider, when we say, *this house* and *that tree*, are nothing but perceptions in the mind, and fleeting copies or representations of other existences, which remain uniform and independent.

So far, then, are we necessitated by reasoning to contradict or depart from the primary instincts of nature, and to embrace a new system with regard to the evidence of our senses. But here philosophy finds herself extremely embarrassed, when she would justify this new system, and obviate the cavils and objections of the sceptics. She can no longer plead the infallible and irresistible instinct of nature: for that led us to a quite different system, which is acknowledged fallible and even erroneous. And to justify this pretended philosophical system, by a chain of clear and convincing argument, or even any appearance of argument, exceeds the power of all human capacity.

By what argument can it be proved, that the perceptions of the mind must be caused by external objects, entirely different from them, though resembling them (if that be possible) and could not arise either from the energy of the mind itself, or from the suggestion of some invisible and unknown spirit, or from some other cause still more unknown to us? It is acknowledged, that, in fact, many of these perceptions arise not from anything external, as in dreams, madness, and other diseases. And nothing can be more inexplicable than the manner, in which body should so operate upon mind as ever to convey an image of itself to a substance, supposed of so different, and even contrary a nature.

It is a question of fact, whether the perceptions of the senses be produced by external objects, resembling them: how shall this question be determined? By experience surely; as all other questions of a like nature. But here experience is, and must be entirely silent. The mind has never anything present to it but the perceptions, and cannot possibly reach any experience of their connexion with objects. The supposition of such a connexion is, therefore, without any foundation in reasoning.

Hume, *Concerning Human Understanding*, XII, 118-119

31 As we have no immediate experience of what other men feel, we can form no idea of the manner in which they are affected, but by conceiving what we ourselves should feel in the like situation. Though our brother is upon the rack, as long as we ourselves are at our ease, our senses will never inform us of what he suffers. They never did and never can carry us beyond our own person, and it is by the imagination only that we can form any conception of what are his sensations.

Adam Smith, *Theory of Moral Sentiments*, I, 1

32 In whatsoever mode, or by whatsoever means, our knowledge may relate to objects, it is at least quite clear that the only manner in which it immediately relates to them is by means of an intuition. To this as the indispensable groundwork, all thought points. But an intuition can take place only in so far as the object is given to us. This, again, is only possible, to man at least, on condition that the object affect the mind in a certain manner. The capacity for receiving representations (receptivity) through the mode in which we are affected by objects, is called *sensibility*. By means of sensibility, therefore, objects are given to us, and it alone furnishes us with intuitions; by the understanding they are *thought*, and from it arise conceptions. But all thought must directly, or indirectly, by means of certain signs, relate ultimately to intuitions; consequently, with us, to sensibility, because in no other way can an object be given to us.

The effect of an object upon the faculty of rep-

resentation, so far as we are affected by the said object, is sensation. That sort of intuition which relates to an object by means of sensation is called an empirical intuition. The undetermined object of an empirical intuition is called *phenomenon*. That which in the phenomenon corresponds to the sensation, I term its *matter*; but that which effects that the content of the phenomenon can be arranged under certain relations, I call its *form*. But that in which our sensations are merely arranged, and by which they are susceptible of assuming a certain form, cannot be itself sensation. It is, then, the matter of all phenomena that is given to us *a posteriori*; the form must lie ready *a priori* for them in the mind, and consequently can be regarded separately from all sensation.

I call all representations *pure*, in the transcendental meaning of the word, wherein nothing is met with that belongs to sensation. And accordingly we find existing in the mind *a priori*, the pure form of sensuous intuitions in general, in which all the manifold content of the phenomenal world is arranged and viewed under certain relations. This pure form of sensibility I shall call *pure intuition*. Thus, if I take away from our representation of a body all that the understanding thinks as belonging to it, as substance, force, divisibility, etc., and also whatever belongs to sensation, as impenetrability, hardness, colour, etc.; yet there is still something left us from this empirical intuition, namely, extension and shape. These belong to pure intuition, which exists *a priori* in the mind, as a mere form of sensibility, and without any real object of the senses or any sensation.

Kant, *Critique of Pure Reason*,  
Transcendental Aesthetic

- 33 In general, we receive impressions only in consequence of motion, and we might establish it as an axiom *that, WITHOUT MOTION, THERE IS NO SENSATION*. This general principle applies very accurately to the sensations of heat and cold: when we touch a cold body, the caloric which always tends to become *in equilibrio* in all bodies, passes from our hand into the body we touch, which gives us the feeling or sensation of cold. The direct contrary happens, when we touch a warm body, the caloric then passing from the body into our hand produces the sensation of heat. If the hand and the body touched be of the same temperature, or very nearly so, we receive no impression, either of heat or cold, because there is no motion or passage of caloric; and thus no sensation can take place without some correspondent motion to occasion it.

Lavoisier, *Elements of Chemistry*, I, 1

- 34 The eye—it cannot choose but see;  
We cannot bid the ear be still;  
Our bodies feel, where'er they be,  
Against or with our will.

Wordsworth, *Expostulation and Reply*

- 35 O for a life of Sensations rather than of Thoughts!  
Keats, *Letter to Benjamin Bailey*  
(Nov. 22, 1817)

- 36 Only one absolute certainty is possible to man, namely, that at any given moment the feeling which he has exists.

T. H. Huxley, *Letter to J. G. T. Sinclair*  
(July 21, 1890)

- 37 Are not the sensations we get from the same object, for example, always the same? Does not the same piano-key, struck with the same force, make us hear in the same way? Does not the same grass give us the same feeling of green, the same sky the same feeling of blue, and do we not get the same olfactory sensation no matter how many times we put our nose to the same flask of cologne? It seems a piece of metaphysical sophistry to suggest that we do not; and yet a close attention to the matter shows that *there is no proof that the same bodily sensation is ever got by us twice*.

*What is got twice is the same object.* We hear the same note over and over again; we see the same quality of green, or smell the same objective perfume, or experience the same *species* of pain. The realities, concrete and abstract, physical and ideal, whose permanent existence we believe in, seem to be constantly coming up again before our thought, and lead us, in our carelessness, to suppose that our "ideas" of them are the same ideas. When we come, some time later, to the chapter on Perception, we shall see how inveterate is our habit of not attending to sensations as subjective facts, but of simply using them as stepping-stones to pass over to the recognition of the realities whose presence they reveal. The grass out of the window now looks to me of the same green in the sun as in the shade, and yet a painter would have to paint one part of it dark brown, another part bright yellow, to give its real sensational effect. We take no heed, as a rule, of the different way in which the same things look and sound and smell at different distances and under different circumstances. The sameness of the *things* is what we are concerned to ascertain; and any sensations that assure us of that will probably be considered in a rough way to be the same with each other. This is what makes off-hand testimony about the subjective identity of different sensations well-nigh worthless as a proof of the fact. The entire history of Sensation is a commentary on our inability to tell whether two sensations received apart are exactly alike.

William James, *Psychology*, IX

- 38 Nature . . . is frugal in her operations, and will not be at the expense of a particular instinct to give us that knowledge which experience and habit will soon produce. Reproduced sights and contacts tied together with the present sensation

in the unity of a *thing* with a name, these are the complex objective stuff out of which my actually perceived table is made. Infants must go through a long education of the eye and ear before they can perceive the realities which adults perceive. *Every perception is an acquired perception.*

William James, *Psychology*, XIX

- 39 A sensation is rather like a client who has given his case to a lawyer and then has passively to listen in the courtroom to whatever account of his

affairs, pleasant or unpleasant, the lawyer finds it most expedient to give.

William James, *Pragmatism*, VII

- 40 The state of becoming conscious is a special psychic act, different from and independent of the process of becoming fixed or represented, and consciousness appears to us as a sensory organ which perceives a content proceeding from another source.

Freud, *Interpretation of Dreams*, IV

## 5.3 | Memory

The two most famous metaphors that have been used to say what memory is—one, that it is the storehouse of ideas; the other, that it is decaying sense—may give us some grasp of the subject, but upon closer examination they are more misleading than instructive. Something must be experienced or learned before it can be remembered, and that which is remembered must somehow be retained between the time of acquisition and the time of recall or recollection; but after we have acknowledged these two points, we are left with many difficult questions about the objects of memory, about the kind of knowledge that memory is, about the difference between immediate memory and memory after a long interval of time, about the

related processes of reminiscence, recollection, and recognition, about the gradual fading away of memories, and forgetfulness and forgetting.

The quotations collected here touch on all these matters as well as others, and represent the fascination of memory not only for psychologists and philosophers, but also for the poets and the historians, who are concerned with our sense of time and our knowledge of the past. That fascination is, perhaps, most eloquently expressed in the passages taken from Augustine's *Confessions*. The modern scientific and the psychoanalytical interest in the subject are represented here in the quotations from William James and Sigmund Freud.

- 1 Cebes added: Your favourite doctrine, Socrates, that knowledge is simply recollection, if true, also necessarily implies a previous time in which we have learned that which we now recollect. But this would be impossible unless our soul had been in some place before existing in the form of man; here then is another proof of the soul's immortality.

But tell me, Cebes, said Simmias, interposing, what arguments are urged in favour of this doc-

trine of recollection. I am not very sure at the moment that I remember them.

One excellent proof, said Cebes, is afforded by questions. If you put a question to a person in a right way, he will give a true answer of himself, but how could he do this unless there were knowledge and right reason already in him? And this is most clearly shown when he is taken to a diagram or to anything of that sort. . . .

And if we acquired this knowledge before we