Chapter VIII
Some Further Considerations Concerning our Simple Ideas of Sensation

1. Positive ideas from privative causes. Concerning the simple ideas of Sensation, it is to be considered,—that whatsoever is so constituted in nature as to be able, by affecting our senses, to cause any perception in the mind, doth thereby produce in the understanding a simple idea; which, whatever be the external cause of it, when it comes to be taken notice of by our discerning faculty, it is by the mind looked on and considered there to be a real positive idea in the understanding, as much as any other whatsoever; though, perhaps, the cause of it be but a privation of the subject.

2. Ideas in the mind distinguished from that in things which gives rise to them. Thus the ideas of heat and cold, light and darkness, white and black, motion and rest, are equally clear and positive ideas in the mind; though, perhaps, some of the causes which produce them are barely privations, in those subjects from whence our senses derive those ideas. These the understanding, in its view of them, considers all as distinct positive ideas, without taking notice of the causes that produce them: which is an inquiry not belonging to the idea, as it is in the understanding, but to the nature of the things existing without us. These are two very different things, and carefully to be distinguished; it being one thing to perceive and know the idea of white or black, and quite another to examine what kind of particles they must be, and how ranged in the superficies, to make any object appear white or black.

3. We may have the ideas when we are ignorant of their physical causes. A painter or dyer who never inquired into their causes hath the ideas of white and black, and other colours, as clearly, perfectly, and distinctly in his understanding, and perhaps more distinctly, than the philosopher who hath busied himself in considering their natures, and thinks he knows how far either of them is, in its cause, positive or privative; and the idea of black is no less positive in his mind than that of white, however the cause of that colour in the external object may be only a privation.

4. Why a privative cause in nature may occasion a positive idea. If it were the design of my present undertaking to inquire into the natural causes and manner of perception, I should offer this as a reason why a privative cause might, in some cases at least, produce a positive idea; viz. that all sensation being produced in us only by different degrees and modes of motion in our animal spirits, variously agitated by external objects, the abatement of any former motion must as necessarily produce a new sensation as the variation or increase of it; and so introduce a new idea, which depends only on a different motion of the animal spirits in that organ.

5. Negative names need not be meaningless. But whether this be so or not I will not here determine, but appeal to every one's own experience, whether the shadow of a man, though it consists of nothing but the absence of light (and
the more the absence of light is, the more discernible is the shadow) does not, when a man looks on it, cause as clear and positive idea in his mind as a man himself, though covered over with clear sunshine? And the picture of a shadow is a positive thing. Indeed, we have negative names, which stand not directly for positive ideas, but for their absence, such as insipid, silence, nihil, &c.; which words denote positive ideas, v.g. taste, sound, being, with a signification of their absence.

6. Whether any ideas are due to causes really privative. And thus one may truly be said to see darkness. For, supposing a hole perfectly dark, from whence no light is reflected, it is certain one may see the figure of it, or it may be painted; or whether the ink I write with makes any other idea, is a question. The privative causes I have here assigned of positive ideas are according to the common opinion; but, in truth, it will be hard to determine whether there be really any ideas from a privative cause, till it be determined, whether rest be any more a privation than motion.

7. Ideas in the mind, qualities in bodies. To discover the nature of our ideas the better, and to discourse of them intelligibly, it will be convenient to distinguish them as they are ideas or perceptions in our minds; and as they are modifications of matter in the bodies that cause such perceptions in us: that so we may not think (as perhaps usually is done) that they are exactly the images and resemblances of something inherent in the subject; most of those of sensation being in the mind no more the likeness of something existing without us, than the names that stand for them are the likeness of our ideas, which yet upon hearing they are apt to excite in us.

8. Our ideas and the qualities of bodies. Whatsoever the mind perceives in itself, or is the immediate object of perception, thought, or understanding, that I call idea; and the power to produce any idea in our mind, I call quality of the subject wherein that power is. Thus a snowball having the power to produce in us the ideas of white, cold, and round,—the power to produce those ideas in us, as they are in the snowball, I call qualities; and as they are sensations or perceptions in our understandings, I call them ideas; which ideas, if I speak of sometimes as in the things themselves, I would be understood to mean those qualities in the objects which produce them in us.

9. Primary qualities of bodies. Qualities thus considered in bodies are,

First, such as are utterly inseparable from the body, in what state soever it be; and such as in all the alterations and changes it suffers, all the force can be used upon it, it constantly keeps; and such as sense constantly finds in every particle of matter which has bulk enough to be perceived; and the mind finds inseparable from every particle of matter, though less than to make itself singly be perceived by our senses: v.g. Take a grain of wheat, divide it into two parts; each part has still solidity, extension, figure, and mobility: divide it again, and it retains still the same qualities; and so divide it on, till the parts become insensible; they must retain still each of them all those qualities. For division (which is all that a mill, or pestle, or any other body, does upon another, in reducing it to insensible parts) can never take away either solidity, extension, figure, or mobility from any body, but only makes two or more distinct separate masses of matter, of that which was but one before; all which distinct masses, reckoned as so many distinct bodies, after
division, make a certain number. These I call original or primary qualities of body, which I think we may observe to produce simple ideas in us, viz. solidity, extension, figure, motion or rest, and number.

10. Secondary qualities of bodies. Secondly, such qualities which in truth are nothing in the objects themselves but power to produce various sensations in us by their primary qualities, i.e. by the bulk, figure, texture, and motion of their insensible parts, as colours, sounds, tastes, &c. These I call secondary qualities. To these might be added a third sort, which are allowed to be barely powers; though they are as much real qualities in the subject as those which I, to comply with the common way of speaking, call qualities, but for distinction, secondary qualities. For the power in fire to produce a new colour, or consistency, in wax or day,—by its primary qualities, is as much a quality in fire, as the power it has to produce in me a new idea or sensation of warmth or burning, which I felt not before,—by the same primary qualities, viz. the bulk, texture, and motion of its insensible parts.

11. How bodies produce ideas in us. 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.

12. By motions, external, and in our organism. 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.

13. How secondary qualities produce their ideas. 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.
They depend on the primary qualities. 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.

15. Ideas of primary qualities are resemblances; of secondary, not. From whence I think it easy to draw this observation,— that the ideas of primary qualities of bodies are resemblances of them, and their patterns do really exist in the bodies themselves, but the ideas produced in us by these secondary qualities have no resemblance of them at all. There is nothing like our ideas, existing in the bodies themselves. They are, in the bodies we denominate from them, only a power to produce those sensations in us: and what is sweet, blue, or warm in idea, is but the certain bulk, figure, and motion of the insensible parts, in the bodies themselves, which we call so.

16. Examples. Flame is denominated hot and light; snow, white and cold; and manna, white and sweet, from the ideas they produce in us. Which qualities are commonly thought to be the same in those bodies that those ideas are in us, the one the perfect resemblance of the other, as they are in a mirror, and it would by most men be judged very extravagant if one should say otherwise. And yet he that will consider that the same fire that, at one distance produces in us the sensation of warmth, does, at a nearer approach, produce in us the far different sensation of pain, ought to bethink himself what reason he has to say,— that this idea of warmth, which was produced in him by the fire, is actually in the fire; and his idea of pain, which the same fire produced in him the same way, is not in the fire. Why are whiteness and coldness in snow, and pain not, when it produces the one and the other idea in us; and can do neither, but by the bulk, figure, number, and motion of its solid parts?

17. The ideas of the primary alone really exist. The particular bulk, number, figure, and motion of the parts of fire or snow are really in them,— whether any one's senses perceive them or no: and therefore they may be called real qualities, because they really exist in those bodies. But light, heat, whiteness, or coldness, are no more really in them than sickness or pain is in manna. Take away the sensation of them; let not the eyes see light or colours, nor the ears hear sounds; let the palate not taste, nor the nose smell, and all colours, tastes, odours, and sounds, as they are such particular ideas, vanish and cease, and are reduced to their causes, i.e. bulk, figure, and motion of parts.

18. The secondary exist in things only as modes of the primary. A piece of manna of a sensible bulk is able to produce in us the idea of a round or square figure; and by being removed from one place to another, the idea of motion. This idea of motion represents it as it really is in manna moving: a circle or square are the same, whether in idea or existence, in the mind or in the manna. And this, both motion and figure, are really in the manna, whether we take notice of them or no: this everybody is ready to agree to. Besides, manna, by the bulk, figure, texture, and motion of its parts, has a power to produce the sensations of sickness, and sometimes of acute pains or gripings in us. That these ideas of sickness and pain are not in the manna, but effects
of its operations on us, and are nowhere when we feel them not; this also every one readily agrees to. And yet men are hardly to be brought to think that sweetness and whiteness are not really in manna; which are but the effects of the operations of manna, by the motion, size, and figure of its particles, on the eyes and palate: as the pain and sickness caused by manna are confessedly nothing but the effects of its operations on the stomach and guts, by the size, motion, and figure of its insensible parts, (for by nothing else can a body operate, as has been proved): as if it could not operate on the eyes and palate, and thereby produce in the mind particular distinct ideas, which in itself it has not, as well as we allow it can operate on the guts and stomach, and thereby produce distinct ideas, which in itself it has not. These ideas, being all effects of the operations of manna on several parts of our bodies, by the size, figure number, and motion of its parts;—why those produced by the eyes and palate should rather be thought to be really in the manna, than those produced by the stomach and guts; or why the pain and sickness, ideas that are the effect of manna, should be thought to be nowhere when they are not felt; and yet the sweetness and whiteness, effects of the same manna on other parts of the body, by ways equally as unknown, should be thought to exist in the manna, when they are not seen or tasted, would need some reason to explain.

19. Examples. Let us consider the red and white colours in porphyry. Hinder light from striking on it, and its colours vanish; it no longer produces any such ideas in us: upon the return of light it produces these appearances on us again. Can any one think any real alterations are made in the porphyry by the presence or absence of light; and that those ideas of whiteness and redness are really in porphyry in the light, when it is plain it has no colour in the dark? It has, indeed, such a configuration of particles, both night and day, as are apt, by the rays of light rebounding from some parts of that hard stone, to produce in us the idea of redness, and from others the idea of whiteness; but whiteness or redness are not in it at any time, but such a texture that hath the power to produce such a sensation in us.

20. Pound an almond, and the dear white colour will be altered into a dirty one, and the sweet taste into an oily one. What real alteration can the beating of the pestle make in any body, but an alteration of the texture of it?

21. Explains how water felt as cold by one hand may be warm to the other. Ideas being thus distinguished and understood, we may be able to give an account how the same water, at the same time, may produce the idea of cold by one hand and of heat by the other: whereas it is impossible that the same water, if those ideas were really in it, should at the same time be both hot and cold. For, if we imagine warmth, as it is in our hands, to be nothing but a certain sort and degree of motion in the minute particles of our nerves or animal spirits, we may understand how it is possible that the same water may, at the same time, produce the sensations of heat in one hand and cold in the other; which yet figure never does, that never producing—the idea of a square by one hand which has produced the idea of a globe by another. But if the sensation of heat and cold be nothing but the increase or diminution of the motion of the minute parts of our bodies, caused by the corpuscles of any other body, it is easy to be understood, that if that motion be greater in one
hand than in the other; if a body be applied to the two hands, which has in its minute particles a greater motion than in those of one of the hands, and a less than in those of the other, it will increase the motion of the one hand and lessen it in the other; and so cause the different sensations of heat and cold that depend thereon.

22. A n excursion into natural philosophy. I have in what just goes before been engaged in physical inquiries a little further than perhaps I intended. But, it being necessary to make the nature of sensation a little understood; and to make the difference between the qualities in bodies, and the ideas produced by them in the mind, to be distinctly conceived, without which it were impossible to discourse intelligibly of them;— I hope I shall be pardoned this little excursion into natural philosophy; it being necessary in our present inquiry to distinguish the primary and real qualities of bodies, which are always in them (viz. solidity, extension, figure, number, and motion, or rest, and are sometimes perceived by us, viz. when the bodies they are in are big enough singly to be discerned), from those secondary and imputed qualities, which are but the powers of several combinations of those primary ones, when they operate without being distinctly discerned;— whereby we may also come to know what ideas are, and what are not, resemblances of something really existing in the bodies we denominate from them.

23. Three sorts of qualities in bodies. The qualities, then, that are in bodies, rightly considered, are of three sorts:—

First, The bulk, figure, number, situation, and motion or rest of their solid parts. Those are in them, whether we perceive them or not; and when they are of that size that we can discover them, we have by these an idea of the thing as it is in itself; as is plain in artificial things. These I call primary qualities.

Secondly, The power that is in any body, by reason of its insensible primary qualities, to operate after a peculiar manner on any of our senses, and thereby produce in us the different ideas of several colours, sounds, smells, tastes, &c. These are usually called sensible qualities.

Thirdly, The power that is in any body, by reason of the particular constitution of its primary qualities, to make such a change in the bulk, figure, texture, and motion of another body, as to make it operate on our senses differently from what it did before. Thus the sun has a power to make wax white, and fire to make lead fluid. These are usually called powers.

The first of these, as has been said, I think may be properly called real, original, or primary qualities; because they are in the things themselves, whether they are perceived or not: and upon their different modifications it is that the secondary qualities depend.

The other two are only powers to act differently upon other things: which powers result from the different modifications of those primary qualities.

24. T he first are resemblances; the second thought to be resemblances, but are not; the third neither are nor are thought so. But, though the two latter sorts of qualities are powers barely, and nothing but powers, relating to several other bodies, and resulting from the different modifications of the original qualities, yet they are generally otherwise thought of. For the second
sort, viz, the powers to produce several ideas in us, by our senses, are looked upon as real qualities in the things thus affecting us; but the third sort are called and esteemed barely powers. v.g. The idea of heat or light, which we receive by our eyes, or touch, from the sun, are commonly thought real qualities existing in the sun, and something more than mere powers in it. But when we consider the sun in reference to wax, which it melts or blanches, we look on the whiteness and softness produced in the wax, not as qualities in the sun, but effects produced by powers in it. Whereas, if rightly considered, these qualities of light and warmth, which are perceptions in me when I am warmed or enlightened by the sun, are no otherwise in the sun, than the changes made in the wax, when it is blanched or melted, are in the sun. They are all of them equally powers in the sun, depending on its primary qualities; whereby it is able, in the one case, so to alter the bulk, figure, texture, or motion of some of the insensible parts of my eyes or hands, as thereby to produce in me the idea of light or heat; and in the other, it is able so to alter the bulk, figure, texture, or motion of the insensible parts of the wax, as to make them fit to produce in me the distinct ideas of white and fluid.

25. Why the secondary are ordinarily taken for real qualities, and not for bare powers. The reason why the one are ordinarily taken for real qualities, and the other only for bare powers, seems to be, because the ideas we have of distinct colours, sounds, &c., containing nothing at all in them of bulk, figure, or motion, we are not apt to think them the effects of these primary qualities; which appear not, to our senses, to operate in their production, and with which they have not any apparent congruity or conceivable connexion. Hence it is that we are so forward to imagine, that those ideas are the resemblances of something really existing in the objects themselves: since sensation discovers nothing of bulk, figure, or motion of parts in their production; nor can reason show how bodies, by their bulk, figure, and motion, should produce in the mind the ideas of blue or yellow, &c. But, in the other case, in the operations of bodies changing the qualities one of another, we plainly discover that the quality produced hath commonly no resemblance with anything in the thing producing it; wherefore we look on it as a bare effect of power. For, through receiving the idea of heat or light from the sun, we are apt to think it is a perception and resemblance of such a quality in the sun; yet when we see wax, or a fair face, receive change of colour from the sun, we cannot imagine that to be the reception or resemblance of anything in the sun, because we find not those different colours in the sun itself. For, our senses being able to observe a likeness or unlikeness of sensible qualities in two different external objects, we forwardly enough conclude the production of any sensible quality in any subject to be an effect of bare power, and not the communication of any quality which was really in the efficient, when we find no such sensible quality in the thing that produced it. But our senses, not being able to discover any unlikeness between the idea produced in us, and the quality of the object producing it, we are apt to imagine that our ideas are resemblances of something in the objects, and not the effects of certain powers placed in the modification of their primary qualities, with which primary qualities the ideas produced in us have no resemblance.
26. Secondary qualities twofold; first, immediately perceivable; secondly, mediately perceivable. To conclude. Besides those before-mentioned primary qualities in bodies, viz. bulk, figure, extension, number, and motion of their solid parts; all the rest, whereby we take notice of bodies, and distinguish them one from another, are nothing else but several powers in them, depending on those primary qualities; whereby they are fitted, either by immediately operating on our bodies to produce several different ideas in us; or else, by operating on other bodies, so to change their primary qualities as to render them capable of producing ideas in us different from what before they did. The former of these, I think, may be called secondary qualities immediately perceivable: the latter, secondary qualities, mediately perceivable.