

Session 2

Readings for Monday Lecture by James Navarro

Of Ideas (1690)

John Locke

Chapter I: Of Ideas in general, and their Original

1. Idea is the object of thinking. Every man being conscious to himself that he thinks; and that which his mind is applied about whilst thinking being the ideas that are there, it is past doubt that men have in their minds several ideas,—such as are those expressed by the words whiteness, hardness, sweetness, thinking, motion, man, elephant, army, drunkenness, and others: it is in the first place then to be inquired, How he comes by them?

I know it is a received doctrine, that men have native ideas, and original characters, stamped upon their minds in their very first being. This opinion I have at large examined already; and, I suppose what I have said in the foregoing Book will be much more easily admitted, when I have shown whence the understanding may get all the ideas it has; and by what ways and degrees they may come into the mind;—for which I shall appeal to every one's own observation and experience.

2. All ideas come from sensation or reflection. Let us then suppose the mind to be, as we say, white paper, void of all characters, without any ideas:—How comes it to be furnished? Whence comes it by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this I answer, in one word, from EXPERIENCE. In that all our knowledge is founded; and from that it ultimately derives itself. Our observation employed either, about external sensible objects, or about the internal operations of our minds perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge, from whence all the ideas we have, or can naturally have, do spring.

3. The objects of sensation one source of ideas. First, our Senses, conversant about particular sensible objects, do convey into the mind several distinct perceptions of things, according to those various ways wherein those objects do affect them. And thus we come by those ideas we have of yellow, white, heat, cold, soft, hard, bitter, sweet, and all those which we call sensible qualities; which when I say the senses convey into the mind, I mean, they from external objects convey into the mind what produces there those perceptions. This great source of most of the ideas we have, depending wholly upon our senses, and derived by them to the understanding, I call SENSATION.

4. The operations of our minds, the other source of them. Secondly, the other fountain from which experience furnisheth the understanding with ideas is,—the perception of the operations of our own mind within us, as it is employed about the ideas it has got;—which operations, when the soul comes to reflect on and consider, do furnish the understanding with another set of ideas, which could not be had from things without. And such are perception, thinking, doubting, believing, reasoning, knowing, willing, and all the different actings of our own minds;—which we being conscious of, and observing in ourselves, do from these receive into our understandings as distinct ideas as we do from bodies affecting

our senses. This source of ideas every man has wholly in himself; and though it be not sense, as having nothing to do with external objects, yet it is very like it, and might properly enough be called internal sense. But as I call the other SENSATION, so I Call this REFLECTION, the ideas it affords being such only as the mind gets by reflecting on its own operations within itself. By reflection then, in the following part of this discourse, I would be understood to mean, that notice which the mind takes of its own operations, and the manner of them, by reason whereof there come to be ideas of these operations in the understanding. These two, I say, viz. external material things, as the objects of SENSATION, and the operations of our own minds within, as the objects of REFLECTION, are to me the only originals from whence all our ideas take their beginnings. The term operations here I use in a large sense, as comprehending not barely the actions of the mind about its ideas, but some sort of passions arising sometimes from them, such as is the satisfaction or uneasiness arising from any thought.

5. All our ideas are of the one or the other of these. The understanding seems to me not to have the least glimmering of any ideas which it doth not receive from one of these two. External objects furnish the mind with the ideas of sensible qualities, which are all those different perceptions they produce in us; and the mind furnishes the understanding with ideas of its own operations.

These, when we have taken a full survey of them, and their several modes, combinations, and relations, we shall find to contain all our whole stock of ideas; and that we have nothing in our minds which did not come in one of these two ways. Let any one examine his own thoughts, and thoroughly search into his understanding; and then let him tell me, whether all the original ideas he has there, are any other than of the objects of his senses, or of the operations of his mind, considered as objects of his reflection. And how great a mass of knowledge soever he imagines to be lodged there, he will, upon taking a strict view, see that he has not any idea in his mind but what one of these two have imprinted;—though perhaps, with infinite variety compounded and enlarged by the understanding, as we shall see hereafter.

(...)

Chapter II: Of Simple Ideas

1. Uncompounded appearances. The better to understand the nature, manner, and extent of our knowledge, one thing is carefully to be observed concerning the ideas we have; and that is, that some of them are simple and some complex.

Though the qualities that affect our senses are, in the things themselves, so united and blended, that there is no separation, no distance between them; yet it is plain, the ideas they produce in the mind enter by the senses simple and unmixed. For, though the sight and touch often take in from the same object, at the same time, different ideas;—as a man sees at once motion and colour; the hand feels softness and warmth in the same piece of wax: yet the simple ideas thus united in the same subject, are as perfectly distinct as those that come in by different senses. The coldness and hardness which a man feels in a piece of ice being as distinct ideas in the mind as the smell and whiteness of a lily; or as the taste of sugar, and smell of a rose. And there is nothing can be plainer to a man than the clear and distinct perception he has of those simple ideas; which, being each in itself uncompounded, contains in it nothing but one uniform appearance, or conception in the mind, and is not distinguishable into different ideas.

2. The mind can neither make nor destroy them. These simple ideas, the materials of all our knowledge, are suggested and furnished to the mind only by those two ways above mentioned, viz. sensation and reflection. When the understanding is once stored with these simple ideas, it has the power to repeat, compare, and unite them, even to an almost infinite variety, and so can make at pleasure new complex ideas. But it is not in the power of the most exalted wit, or enlarged understanding, by any quickness or variety of thought, to invent or frame one new simple idea in the mind, not taken in by the

ways before mentioned: nor can any force of the understanding destroy those that are there. The dominion of man, in this little world of his own understanding being much what the same as it is in the great world of visible things; wherein his power, however managed by art and skill, reaches no farther than to compound and divide the materials that are made to his hand; but can do nothing towards the making the least particle of new matter, or destroying one atom of what is already in being. The same inability will every one find in himself, who shall go about to fashion in his understanding one simple idea, not received in by his senses from external objects, or by reflection from the operations of his own mind about them. I would have any one try to fancy any taste which had never affected his palate; or frame the idea of a scent he had never smelt: and when he can do this, I will also conclude that a blind man hath ideas of colours, and a deaf man true distinct notions of sounds.

3. Only the qualities that affect the senses are imaginable. This is the reason why—though we cannot believe it impossible to God to make a creature with other organs, and more ways to convey into the understanding the notice of corporeal things than those five, as they are usually counted, which he has given to man—yet I think it is not possible for any man to imagine any other qualities in bodies, howsoever constituted, whereby they can be taken notice of, besides sounds, tastes, smells, visible and tangible qualities. And had mankind been made but with four senses, the qualities then which are the objects of the fifth sense had been as far from our notice, imagination, and conception, as now any belonging to a sixth, seventh, or eighth sense can possibly be;—which, whether yet some other creatures, in some other parts of this vast and stupendous universe, may not have, will be a great presumption to deny. He that will not set himself proudly at the top of all things, but will consider the immensity of this fabric, and the great variety that is to be found in this little and inconsiderable part of it which he has to do with, may be apt to think that, in other mansions of it, there may be other and different intelligent beings, of whose faculties he has as little knowledge or apprehension as a worm shut up in one drawer of a cabinet hath of the senses or understanding of a man; such variety and excellency being suitable to the wisdom and power of the Maker. I have here followed the common opinion of man's having but five senses; though, perhaps, there may be justly counted more;—but either supposition serves equally to my present purpose.

(...)

Chapter XII: Of Complex Ideas

1. Made by the mind out of simple ones. We have hitherto considered those ideas, in the reception whereof the mind is only passive, which are those simple ones received from sensation and reflection before mentioned, whereof the mind cannot make one to itself, nor have any idea which does not wholly consist of them. But as the mind is wholly passive in the reception of all its simple ideas, so it exerts several acts of its own, whereby out of its simple ideas, as the materials and foundations of the rest, the others are framed. The acts of the mind, wherein it exerts its power over its simple ideas, are chiefly these three: (1) Combining several simple ideas into one compound one; and thus all complex ideas are made. (2) The second is bringing two ideas, whether simple or complex, together, and setting them by one another, so as to take a view of them at once, without uniting them into one; by which way it gets all its ideas of relations. (3) The third is separating them from all other ideas that accompany them in their real existence: this is called abstraction: and thus all its general ideas are made. This shows man's power, and its ways of operation, to be much the same in the material and intellectual world. For the materials in both being such as he has no power over, either to make or destroy, all that man can do is either to unite them together, or to set them by one another, or wholly separate them. I shall here begin with the first of these in the consideration of complex ideas, and come to the other two in their due places. As simple ideas are observed to exist in several combinations united together, so the mind has a power to consider

several of them united together as one idea; and that not only as they are united in external objects, but as itself has joined them together. Ideas thus made up of several simple ones put together, I call complex;—such as are beauty, gratitude, a man, an army, the universe; which, though complicated of various simple ideas, or complex ideas made up of simple ones, yet are, when the mind pleases, considered each by itself, as one entire thing, and signified by one name.

2. Made voluntarily. In this faculty of repeating and joining together its ideas, the mind has great power in varying and multiplying the objects of its thoughts, infinitely beyond what sensation or reflection furnished it with: but all this still confined to those simple ideas which it received from those two sources, and which are the ultimate materials of all its compositions. For simple ideas are all from things themselves, and of these the mind can have no more, nor other than what are suggested to it. It can have no other ideas of sensible qualities than what come from without by the senses; nor any ideas of other kind of operations of a thinking substance, than what it finds in itself. But when it has once got these simple ideas, it is not confined barely to observation, and what offers itself from without; it can, by its own power, put together those ideas it has, and make new complex ones, which it never received so united.

3. Complex ideas are either of modes, substances, or relations. COMPLEX IDEAS, however compounded and decompounded, though their number be infinite, and the variety endless, wherewith they fill and entertain the thoughts of men; yet I think they may be all reduced under these three heads:—1. MODES. 2. SUBSTANCES. 3. RELATIONS.

4. Ideas of modes. First, Modes I call such complex ideas which, however compounded, contain not in them the supposition of subsisting by themselves, but are considered as dependences on, or affections of substances;—such as are the ideas signified by the words triangle, gratitude, murder, &c. And if in this I use the word mode in somewhat a different sense from its ordinary signification, I beg pardon; it being unavoidable in discourses, differing from the ordinary received notions, either to make new words, or to use old words in somewhat a new signification; the later whereof, in our present case, is perhaps the more tolerable of the two.

5. Simple and mixed modes of simple ideas. Of these modes, there are two sorts which deserve distinct consideration:

First, there are some which are only variations, or different combinations of the same simple idea, without the mixture of any other;—as a dozen, or score; which are nothing but the ideas of so many distinct units added together, and these I call simple modes as being contained within the bounds of one simple idea.

Secondly, there are others compounded of simple ideas of several kinds, put together to make one complex one;—v.g. beauty, consisting of a certain composition of colour and figure, causing delight to the beholder; theft, which being the concealed change of the possession of anything, without the consent of the proprietor, contains, as is visible, a combination of several ideas of several kinds: and these I call mixed modes.

6. Ideas of substances, single or collective. Secondly, the ideas of Substances are such combinations of simple ideas as are taken to represent distinct particular things subsisting by themselves; the supposed or confused idea of substance, such as it is, is always the first and chief. Thus if to substance be joined the simple idea of a certain dull whitish colour, with certain degrees of weight, hardness, ductility, and fusibility, we have the idea of lead; and a combination of the ideas of a certain sort of figure, with the powers of motion, thought and reasoning, joined to substance, the ordinary idea of a man. Now of substances also, there are two sorts of ideas:—one of single substances, as they exist separately, as of a man or a sheep; the other of several of those put together, as an army of men, or flock of sheep—which

collective ideas of several substances thus put together are as much each of them one single idea as that of a man or an unit.

7. Ideas of relation. Thirdly, the last sort of complex ideas is that we call Relation, which consists in the consideration and comparing one idea with another.

Of these several kinds we shall treat in their order.

8. The abstrusest ideas we can have are all from two sources. If we trace the progress of our minds, and with attention observe how it repeats, adds together, and unites its simple ideas received from sensation or reflection, it will lead us further than at first perhaps we should have imagined. And, I believe, we shall find, if we warily observe the originals of our notions, that even the most abstruse ideas, how remote soever they may seem from sense, or from any operations of our own minds, are yet only such as the understanding frames to itself, by repeating and joining together ideas that it had either from objects of sense, or from its own operations about them: so that those even large and abstract ideas are derived from sensation or reflection, being no other than what the mind, by the ordinary use of its own faculties, employed about ideas received from objects of sense, or from the operations it observes in itself about them, may, and does, attain unto.

This I shall endeavour to show in the ideas we have of space, time, and infinity, and some few others that seem the most remote, from those original

John Locke, "Book II: Of Ideas," *An Essay Concerning Human Understanding*.

From <http://ebooks.adelaide.edu.au/l/locke/john/181u/>

Kant's *Critique of Judgement*, Annex nn. 80-82: separate document

Man a Machine (1748)

Julien Offray de La Mettrie

It is not enough for a wise man to study nature and truth; he should dare state truth for the benefit of the few who are willing and able to think. As for the rest, who are voluntarily slaves of prejudice, they can no more attain truth, than frogs can fly.

I reduce to two the systems of philosophy which deal with man's soul. The first and older system is materialism; the second is spiritualism.

The metaphysicians who have hinted that matter may well be endowed with the faculty of thought have perhaps not reasoned ill. For there is in this case a certain advantage in their inadequate way of expressing their meaning. In truth, to ask whether matter can think, without considering it otherwise than in itself, is like asking whether matter can tell time. It may be foreseen that we shall avoid this reef upon which Locke had the bad luck to shipwreck.

The Leibnizians with their monads have set up an unintelligible hypothesis. They have rather spiritualized matter than materialized the soul. How can we define a being whose nature is absolutely unknown to us?

Descartes and all the Cartesians, among whom the followers of Malebranche have long been numbered, have made the same mistake. They have taken for granted two distinct substances in man, as if they had seen them, and positively counted them.

The wisest men have declared that the soul can not know itself save by the light of faith. However, as reasonable beings they have thought that they could reserve for themselves the right of examining what

the Bible means by the word "spirit," which it uses in speaking of the human soul. And if in their investigation, they do not agree with the theologians on this point, are the theologians more in agreement among themselves on all other points?

Here is the result in a few words of all their reflections. If there is a God, he is the Author of nature as well as of revelation. He has given us the one to explain the other, and reason to make them agree.

To distrust the knowledge that can be drawn from the study of animated bodies, is to regard nature and revelation as two contraries which destroy each other, and consequently to dare uphold the absurd doctrine, that God contradicts Himself in His various works and deceives us.

If there is a revelation, it can not then contradict nature. By nature only can we understand the meaning of the words of the Gospel, of which experience is the only truly interpreter. In fact, the commentators before our time have only obscured the truth. We can judge of this by the author of the *Spectacle of Nature*. "It is astonishing," he says concerning Locke, "that a man who degrades our soul far enough to consider it a soul of clay should dare set up reason as judge and sovereign arbiter of the mysteries of faith, for," he adds, "what an astonishing idea of Christianity one would have, if one were to follow reason."

Not only do these reflections fail to elucidate faith, but they also constitute such frivolous objections to the method of those who undertake to interpret the Scripture, that I am almost ashamed to waste time in refuting them.

The excellence of reason does not depend on a big word devoid of meaning (immateriality), but on the force, extent, and perspicuity of reason itself. Thus a "soul of clay" which should discover, at one glance, as it were, the relations and the consequences of an infinite number of ideas hard to understand, would evidently be preferable to a foolish and stupid soul, though that were composed of the most precious elements. A man is not a philosopher because, with Pliny, he blushes over the wretchedness of our origin. What seems vile is here the most precious of things, and seems to be the object of nature's highest art and most elaborate care. But as man, even though he should come from an apparently still more lowly source, would yet be the most perfect of all beings, so whatever the origin of his soul, if it is pure, noble, and lofty, it is a beautiful soul which dignifies the man endowed with it.

Pluche's second way of reasoning seems vicious to me, even in his system, which smacks a little of fanaticism; for [on his view] if we have an idea of faith as being contrary to the clearest principles, to the most incontestable truths, we must yet conclude, out of respect for revelation and its author, that this conception is false, and that we do not yet understand the meaning of the words of the Gospel.

Of the two alternatives, only one is possible: either everything is illusion, nature as well as revelation, or experience alone can explain faith. But what can be more ridiculous than the position of our author! Can one imagine hearing a Peripatetic say, "We ought not to accept the experiments of Torricelli, for if we should accept them, if we should rid ourselves of the horror of the void, what an astonishing philosophy we should have!"

I have shown how vicious the reasoning of Pluche is in order to prove, in the first place, that if there is a revelation, it is not sufficiently demonstrated by the mere authority of the Church, and without any appeal to reason, as all those who fear reason claim: and in the second place, to protect against all assault the method of those who would wish to follow the path that I open to them, of interpreting supernatural things, incomprehensible in themselves, in the light of those ideas with which nature has endowed us. Experience and observation should therefore be our only guides here. Both are to be found throughout the records of the physicians who were philosophers, and not in the works of the philosophers who were not physicians. The former have traveled through and illuminated the labyrinth of man; they alone have laid bare those springs [of life] hidden under the external integument which conceals so many wonders from our eyes. They alone, tranquilly contemplating our soul, have surprised it, a thousand times, both in

its wretchedness and in its glory, and they have no more despised it in the first estate, than they have admired it in the second. Thus, to repeat, only the physicians have a right to speak on this subject. What could the others, especially the theologians, have to say? Is it not ridiculous to hear them shamelessly coming to conclusions about a subject concerning which they have had no means of knowing anything, and from which on the contrary they have been completely turned aside by obscure studies that have led them to a thousand prejudiced opinions, - in a word, to fanaticism, which adds yet more to their ignorance of the mechanism of the body?

But even though we have chosen the best guides, we shall still find many thorns and stumbling blocks in the way.

Man is so complicated a machine that it is impossible to get a clear idea of the machine beforehand, and hence impossible to define it. For this reason, all the investigations have been vain, which the greatest philosophers have made *à priori*, that is to say, in so far as they use, as it were, the wings of the spirit. Thus it is only *à posteriori* or by trying to disentangle the soul from the organs of the body, so to speak, that one can reach the highest probability concerning man's own nature, even though one can not discover with certainty what his nature is.

Let us then take in our hands the staff of experience, paying no heed to the accounts of all the idle theories of the philosophers. To be blind and to think one can do without this staff is the worst kind of blindness. How truly a contemporary writer says that the only vanity fails to gather from secondary causes the same lessons as from primary causes! One can and one even ought to admire all these fine geniuses in their most useless works, such men as Descartes, Malebranche, Leibnitz, Wolff and the rest, but what profit, I ask, has any one gained from their profound meditations, and from all their works? Let us start out then to discover not what has been thought, but what must be thought for the sake of repose in life.

There are as many different minds, different characters, and different customs, as there are different temperaments. Even Galen knew this truth which Descartes carried so far as to claim that medicine alone can change minds and morals, along with bodies. (By the way of *L'histoire de l'âme*, this teaching is incorrectly attributed to Hippocrates.) It is true that melancholy, bile, phlegm, blood etc., - according to the nature, the abundance, and the different combination of these humors - make each man different from another.

In disease the soul is sometimes hidden, showing no sign of life; sometimes it is so inflamed by fury that it seems to be doubled; sometimes, imbecility vanishes and the convalescence of an idiot produces a wise man. Sometimes, again, the greatest genius becomes imbecile and loses the sense of self. Adieu then to all that fine knowledge, acquired at so high a price, and with so much trouble! Here is a paralytic who asks is his leg is in bed with him; there is a soldier who thinks that he still has the arm which has been cut off. The memory of his old sensations, and of the place to which they were referred by his soul, is the cause of this illusion, and of this kind of delirium. The mere mention of the member which he has lost is enough to recall it to his mind, and to make him feel all its motions; and this causes him an indefinable and inexpressible kind of imaginary suffering. This man cries like a child at death's approach, while this other jests. What was needed to change the bravery of Caius Julius, Seneca, or Petronius into cowardice or faintheartedness? Merely an obstruction in the spleen, in the liver, an impediment in the portal vein. Why? Because the imagination is obstructed along with the viscera, and this gives rise to all the singular phenomena of hysteria and hypochondria.

What can I add to the stories already told of those who imagine themselves transformed into wolf-men, cocks or vampires, or of those who think that the dead feed upon them? Why should I stop to speak of the man who imagines that his nose or some other member is of glass? The way to help this man to regain his faculties and his own flesh-and-blood nose is to advise him to sleep on hay, lest he beak the

fragile organ, and then to set fire to the hay that he may be afraid of being burned - a far which has sometimes cured paralysis. But I must touch lightly on facts which everybody knows.

Neither shall I dwell long on the details of the effects of sleep. Here a tired soldier snores in a trench, in the middle of the thunder of hundreds of cannon. His soul hears nothing; his sleep is as deep as apoplexy. A bomb is on the point of crushing him. He will feel this less perhaps than he feels an insect which is under his foot.

On the other hand, this man who is devoured by jealousy, hatred, avarice, or ambition, can never find any rest. The most peaceful spot, the freshest and most calming drinks are alike useless to one who has not freed his heart from the torment of passion.

The soul and the body fall asleep together. As the motion of the blood is calmed, a sweet feeling of peace and quiet spreads through the whole mechanism. The soul feels itself little by little growing heavy as the eyelids droop, and loses its tenseness, as the fibres of the brain relax; thus little by little it becomes as if paralyzed and with it all the muscles of the body. These can no longer sustain the weight of the head, and the soul can no longer bear the burden of thought; it is in sleep as if it were not.

Is the circulation too quick? the soul cannot sleep. Is the soul too much excited? the blood cannot be quieted: it gallops through the veins with an audible murmur/ Such are the two opposite causes of insomnia. A single fright in the midst of our dreams makes the heart beat at double speed and snatches us from needed and delicious repose, as a real grief or an urgent need would do. Lastly as the mere cessation of the functions of the soul produces sleep, there are, even when we are awake (or at least when we are half awake), kinds of very frequent short naps of the mind, vergers' dreams, which show that the soul does not always wait for the body to sleep. For if the soul is not fast asleep, it surely is not far from sleep, since it cannot point out a single object to which it has attended, among the uncounted number of confused ideas which, so to speak, fill the atmosphere of our brains like clouds.

Opium is too closely related to the sleep it produces, to be left out of consideration here. This drug intoxicates, like wine, coffee, etc., each in its own measure and according to the dose. It makes a man happy in a state which would seemingly be the tomb of feeling, as it is the image of death. How sweet is this lethargy! The soul would long never to emerge from it. For the soul has been a prey to the most intense sorrow, but now feels only the joy of suffering past, and of sweetest peace. Opium alters even the will, forcing the soul which wished to wake and to enjoy life, to sleep in spite of itself. I shall omit any reference to the effect of poisons.

Coffee, the well-known antidote for wine, by scourging the imagination, cures our headaches and scatters our cares without laying up for us, as wine does, other headaches for the morrow. But let us contemplate the soul in its other needs.

The human body is a machine which winds its own springs. It is the living image of perpetual movement. Nourishment keeps up the movement which fever excites. Without food, the soul pines away, goes mad, and dies exhausted. The soul is a taper whose light flares up the moment before it goes out. But nourish the body, pour into its veins life-giving juices and strong liquors, and then the soul grows strong like them, as if arming itself with a proud courage, and the soldier whom water would have made to flee, grows bold and runs joyously to death to the sound of drums. Thus a hot drink sets into stormy movement the blood which a cold drink would have calmed.

What power there is in a meal! Joy revives in a sad heart, and infects the souls of comrades, who express their delight in the friendly songs in which the Frenchman excels. The melancholy man alone is dejected, and the studious man is equally out of place [in such company].

Raw meat makes animals fierce, and it would have the same effect on man. This is so true that the English who eat meat red and bloody, and not as well done as ours, seem to share more or less in the savagery due to this kind of food, and to other causes which can be rendered ineffective by education

only. This savagery creates in the soul, pride, hatred, scorn of other nations, indolence and other sentiments which degrade the character, just as heavy food makes a dull and heavy mind whose usual traits are laziness and indolence.

Pope understood well the full power of greediness when he said:

*Catius is ever moral, ever grave
Thinks who endures a knave is next a knave,
Save just at dinner - then prefers no doubt
A rogue with ven'son to a saint without.*

Elsewhere he says:

*See the same man in vigor, in the gout,
Alone, in company, in place or out,
Early at business and at hazard late,
Mad at a fox chase, wise at a debate,
Drunk at a borough, civil at a ball,
Friendly at Hackney, faithless at White Hall.*

(La Salle, Illinois: Open Court Publishing Co., 1912)

From <http://www.cscs.umich.edu/~crshalizi/LaMettrie/Machine/>

First Principles (1867)

Herbert Spencer

Chapter XII: Evolution and Dissolution

§ 93. An entire history of anything must include its appearance out of the imperceptible and its disappearance into the imperceptible. Be it a single object or the whole universe, any account which begins with it in a concrete form, or leaves off with it in a concrete form, is incomplete; since there remains an era of its knowable existence undescribed and unexplained. Admitting, or rather asserting, that knowledge is limited to the phenomenal, we have, by implication, asserted that the sphere of knowledge is co-extensive with the phenomenal—co-extensive with all modes of the Un-knowable that can affect consciousness. Hence, wherever we now find Being so conditioned as to act on our senses, there arise the questions—how came it thus conditioned? and how will it cease to be thus conditioned? Unless on the assumption that it acquired a sensible form at the moment of perception, and lost its sensible form the moment after perception, it must have had an antecedent existence under this sensible form, and will have a subsequent existence under this sensible form. These preceding and succeeding existences under sensible forms, are possible subjects of knowledge; and knowledge has obviously not reached its limits until it has united the past, present, and future histories into a whole.

The sayings and doings of daily life imply more or less such knowledge, actual or potential, of states which have gone before and of states which will come after; and, indeed, the greater part of our knowledge involves these elements. Knowing any man personally, implies having before seen him under a shape much the same as his present shape; and knowing him simply as a man, implies the inferred antecedent states of infancy, childhood, and youth. Though the man's future is not known specifically, it is known generally: the facts that he will die and that his body will decay, are facts which complete in outline the changes to be hereafter gone through by him. So with all the objects around. The pre-existence under concrete forms of the woollens, silks, and cottons we wear, we can trace some distance

back. We are certain that our furniture consists of matter which was aggregated by trees within these few generations. Even of the stones composing the walls of the house, we are able to say that years or centuries ago, they formed parts of some stratum imbedded in the earth. Moreover, respecting the hereafter of the wearable fabrics, the furniture, and the walls, we can assert thus much, that they are all in process of decay, and in periods of various lengths will lose their present coherent shapes. This general information which all men gain concerning the past and future careers of surrounding things, Science has extended, and continues unceasingly to extend. To the biography of the individual man, it adds an intra-uterine biography beginning with him as a microscopic germ; and it follows out his ultimate changes until it finds his body resolved into the gaseous products of decomposition. Not stopping short at the sheep's back and the caterpillar's cocoon, it identifies in wool and silk the nitrogenous matters absorbed by the sheep and the caterpillar from plants. The substance of a plant's leaves, in common with the wood from which furniture is made, it again traces back to the vegetal assimilation of gases from the air and of certain minerals from the soil. And inquiring whence came the stratum of stone that was quarried to build the house, it finds that this was once a loose sediment deposited in an estuary or on the sea bottom.

If, then, the past and the future of each object, is a sphere of possible knowledge; and if intellectual progress consists largely, if not mainly, in widening our acquaintance with this past and this future; it is obvious that we have not acquired all the information within the grasp of our intelligence until we can, in some way or other, express the whole past and the whole future of each object and the aggregate of objects. Usually able, as we are, to say of any visible tangible thing how it came to have its present shape and consistence; we are fully possessed with the conviction that, setting out abruptly as we do with some substance which already had a concrete form, our history is incomplete: the thing had a history preceding the state with which we started. Hence our Theory of Things, considered individually or in their totality, is confessedly imperfect so long as any past or future portions of their sensible existences are unaccounted for.

May it not be inferred that Philosophy has to formulate this passage from the imperceptible into the perceptible, and again from the perceptible into the imperceptible? Is it not clear that this general law of the redistribution of matter and motion, which we lately saw is required to unify the various kinds of changes, must also be one that unifies the successive changes which sensible existences, separately and together, pass through? Only by some formula combining these characters can knowledge be reduced to a coherent whole.

§ 94. Already in the foregoing paragraphs the outline of such a formula is foreshadowed. Already in recognizing the fact that Science, tracing back the genealogies of various objects, finds their components were once in diffused states, and pursuing their histories forwards, finds diffused states will be again assumed by them, we have recognized the fact that the formula must be one comprehending the two opposite processes of concentration and diffusion. And already in thus describing the general nature of the formula, we have approached a specific expression of it. The change from a diffused, imperceptible state, to a concentrated, perceptible state, is an integration of matter and concomitant dissipation of motion; and the change from a concentrated, perceptible state, to a diffused, imperceptible state, is an absorption of motion and concomitant disintegration of matter. These are truisms. Constituent parts cannot aggregate without losing some of their relative motion; and they cannot separate without more relative motion being given to them. We are not concerned here with any motion which the components of a mass have with respect to other masses: we are concerned only with the motion they have with respect to one another. Confining our attention to this internal motion, and to the matter possessing it, the axiom which we have to recognize is that a progressing consolidation involves a decrease of internal motion; and that increase of internal motion involves a progressing unconsolidation.

When taken together, the two opposite processes thus formulated constitute the history of every sensible existence, under its simplest form. Loss of motion and consequent integration, eventually followed by gain of motion and consequent disintegration—see here a statement comprehensive of the entire series of changes passed through: comprehensive in an extremely general way, as any statement which holds of sensible existences at large must be; but still, comprehensive in the sense that all the changes gone through fall within it. This will probably be thought too sweeping an assertion; but we shall quickly find it justified.

§ 95. For here we have to note the further all-important fact, that every change undergone by every sensible existence, is a change in one or other of these two opposite directions. Apparently an aggregate which has passed out of some originally discrete state into a concrete state, thereafter remains for an indefinite period without undergoing further integration, and without beginning to disintegrate. But this is untrue. All things are growing or decaying, accumulating matter or wearing away, integrating or disintegrating. All things are varying in their temperatures, contracting or expanding, integrating or disintegrating. Both the quantity of matter contained in an aggregate, and the quantity of motion contained in it, increase or decrease; and increase or decrease of either is an advance towards greater diffusion or greater concentration. Continued losses or gains of substance, however slow, imply ultimate disappearance or indefinite enlargement; and losses or gains of the insensible motion we call heat, will, if continued, produce complete integration or complete disintegration. The sun's rays falling on a cold mass, augmenting the molecular motions throughout it, and causing it to occupy more space, are beginning a process which if carried far will disintegrate the mass into liquid, and if carried farther will disintegrate the liquid into gas; and the diminution of bulk which a volume of gas undergoes as it parts with some of its molecular motion, is a diminution which, if the loss of molecular motion proceeds, will presently be followed by liquefaction and eventually by solidification. And since there is no such thing as an absolutely constant temperature, the necessary inference is that every aggregate is at every moment progressing towards either greater concentration or greater diffusion.

Not only does all change consisting in the addition or subtraction of matter come under this head; and not only does this head include all change called thermal expansion or contraction; but it is also, in a general way, comprehensive of all change distinguished as transposition. Every internal redistribution which leaves the component molecules or the constituent portions of a mass differently placed with respect to one another, is sure to be at the same time a progress towards integration or towards disintegration—is sure to have altered in some degree the total space occupied. For when the parts have been moved relatively to one another, the chances are infinity to one that their average distances from the common centre of the aggregate are no longer the same. Hence whatever be the special character of the redistribution—be it that of superficial accretion or detachment, be it that of general expansion or contraction, be it that of re-arrangement, it is always an advance in integration or disintegration. It is always this, though it may at the same time be something further.

§ 96. A general idea of these universal actions under their simplest aspects having been obtained, we may now consider them under certain relatively complex aspects. Changes towards greater concentration or greater diffusion, nearly always proceed after a manner much more involved than that above described. Thus far we have supposed one or other of the two opposite processes to go on alone—we have supposed an aggregate to be either losing motion and integrating or gaining motion and disintegrating. But though it is true that every change furthers one or other of these processes, it is not true that either process is ever wholly unqualified by the other. For each aggregate is at all times both gaining motion and losing motion.

Every mass from a grain of sand to a planet, radiates heat to other masses, and absorbs heat radiated by other masses; and in so far as it does the one it becomes integrated, while in so far as it does the other

it becomes disintegrated. Ordinarily in inorganic objects this double process works but unobtrusive effects. Only in a few cases, among which that of a cloud is the most familiar, does the conflict produce rapid and marked transformations. One of these floating bodies of vapour expands and dissipates, if the amount of molecular motion it receives from the Sun and Earth, exceeds that which it loses by radiation into space and towards adjacent surfaces; while, contrariwise, if, drifting over cold mountain tops, it radiates to them much more heat than it receives, the loss of molecular motion is followed by increasing integration of the vapour, ending in the aggregation of it into liquid and the fall of rain. Here, as elsewhere, the integration or the disintegration is a differential result.

In living aggregates, and more especially those classed as animals, these conflicting processes go on with great activity under several forms. There is not merely what we may call the passive integration of matter, that results in inanimate objects from simple molecular attractions; but there is an active integration of it under the form of food. In addition to that passive superficial disintegration which inanimate objects suffer from external agents, animals produce in themselves active internal disintegration, by absorbing such agents into their substance. While, like inorganic aggregates, they passively give off and receive motion, they are also active absorbers of motion latent in food, and active expenders of that motion. But notwithstanding this complication of the two processes, and the immense exaltation of the conflict between them, it remains true that there is always a differential progress towards either integration or disintegration. During the earlier part of the cycle of changes, the integration predominates—there goes on what we call growth. The middle part of the cycle is usually characterized, not by equilibrium between the integrating and disintegrating processes, but by alternate excesses of them. And the cycle closes with a period in which the disintegration, beginning to predominate, eventually puts a stop to integration, and undoes what integration had originally done. At no moment are assimilation and waste so balanced that no increase or decrease of mass is going on. Even in cases where one part is growing while other parts are dwindling, and even in cases where different parts are differently exposed to external sources of motion so that some are expanding while others are contracting, the truth still holds. For the chances are infinity to one against these opposite changes balancing one another; and if they do not balance one another, the aggregate as a whole is integrating or disintegrating.

Everywhere and to the last, therefore, the change at any moment going on forms a part of one or other of the two processes. While the general history of every aggregate is definable as a change from a diffused imperceptible state to a concentrated perceptible state, and again to a diffused imperceptible state; every detail of the history is definable as a part of either the one change or the other. This, then, must be that universal law of redistribution of matter and motion, which serves at once to unify the seemingly diverse groups of changes, as well as the entire course of each group.

§ 97. The processes thus everywhere in antagonism, and everywhere gaining now a temporary and now a more or less permanent triumph the one over the other, we call Evolution and Dissolution. Evolution under its simplest and most general aspect is the integration of matter and concomitant dissipation of motion; while Dissolution is the absorption of motion and concomitant disintegration of matter.

These titles are by no means all that is desirable; or rather we may say that while the last answers its purpose tolerably well, the first is open to grave objections. Evolution has other meanings, some of which are incongruous with, and some even directly opposed to, the meaning here given to it. The evolution of a gas is literally an absorption of motion and disintegration of matter, which is exactly the reverse of that which we here call Evolution—is that which we here call Dissolution. As ordinarily understood, to evolve is to unfold, to open and expand, to throw out, to emit; whereas as we understand it, the act of evolving, though it implies increase of a concrete aggregate, and in so far an expansion of it, implies that its component matter has passed from a more diffused to a more concentrated state—has contracted. The

antithetical word Involution would much more truly express the nature of the process; and would, indeed, describe better the secondary characters of the process which we shall have to deal with presently. We are obliged, however, notwithstanding the liabilities to confusion that must result from these unlike and even contradictory meanings, to use Evolution as antithetical to Dissolution. The word is now so widely recognized as signifying, not, indeed, the general process above described, but sundry of the most conspicuous varieties of it, and certain of its secondary but most remarkable accompaniments, that we cannot now substitute another word. All we can do is carefully to define the interpretation to be given to it.

While, then, we shall by Dissolution everywhere mean the process tacitly implied by its ordinary meaning—the absorption of motion and disintegration of matter; we shall everywhere mean by Evolution, the process which is always an integration of matter and dissipation of motion, but which, as we shall now see, is in most cases much more than this.

Herbert Spencer, *First Principles*, 2nd ed. (London: Williams and Norgate, 1867).

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