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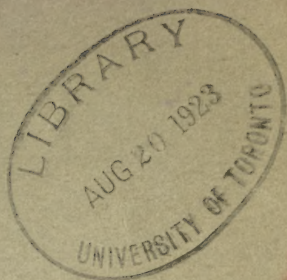
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The influence of
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SCIENCE ON LOCKE'S METHOD AND RESULTS, BY
FULTON H. ANDERSON, PH.D. (TORONTO).

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THE INFLUENCE OF CONTEMPORARY SCIENCE
ON
LOCKE'S METHOD AND RESULTS

BY
FULTON H. ANDERSON, PH.D. (TOR.)

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THE INFLUENCE OF CONTEMPORARY SCIENCE
ON
LOCKE'S METHOD AND RESULTS

By FULTON H. ANDERSON, PH.D.

John Locke considered that his *Essay concerning Human Understanding* contained two important contributions to philosophy; namely, the employment of an "historical, plain method" in contrast to the quibbling upon words by the schools, and doctrines regarding the understanding and its objects in knowledge. Our first purpose is to note this method, and certain results consequent on its use. The second is to offer an account of different approaches to the problems of the *Essay* by showing its relation to a borrowed naturalism based on physics. This naturalism professedly sought to explain the substantial forms, entities, qualities of the schoolmen by certain hypotheses, the result of observed experiments. To these hypotheses Locke did not explicitly assign a methodological value. He is, therefore, an epistemologist, not because of his theories of physics but in spite of them. We shall consider Locke's "new way by ideas" with particular reference to its having on one side a real world of objects, defined by physics, which act on one another as causes and effects, and on the other side a realm of ideas which do not really "copy" things; also, on one side, "simple ideas" which are impressions from real objects, "taken notice of" in the activity of the understanding, and, on the other, "complex ideas" which appear to be compounded by the arbitrary working of the understanding, and hence are ostensibly both "secondary" and "artificial."

Locke and Science

During Locke's life English science was in revolution, and the new teaching was being brought to a climax, through

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the efforts of a group of which Locke was a member, and especially by two with whom he worked, Robert Boyle and Thomas Sydenham—the respective “founders” of modern chemistry and medicine. Locke deserves no more than slight recognition as a discoverer in any field, with the possible exception of medicine: yet he carried on abundant investigations in the different sciences. In his practice of medicine he refused to treat diseases by conventional rules, “sacred principles,” and according to antiquated formulæ.¹ He kept a faithful record of the history of different cases, and employed such remedies as were indicated by experimental studies in chemistry, botany, and anatomy, and the specific reactions of the different diseases throughout their courses to different medicines. For Boyle he conducted experiments in physics, chemistry, and medicine, and with Sydenham² he practised. They advocated a new method based on these principles: (a) Reject high-phrased general notions which claim to be specific truths. (b) Cease to propitiate supernatural influences. (c) Observe the working of things as they appear. (d) Make detailed investigations into the different dispositions of things and resolve phenomena into a number of elements. (e) Substitute for the “philosophical hypothesis,” those hypotheses reached through noting “with the utmost exactitude . . . conjunct causes.”

From his early student days Locke rebelled against the “captious and fallacious use of doubtful words” and insisted that “truth is to be supported by a mature and due consideration of things themselves, and not by artificial terms and ways of arguing.” He first attacked the “predicaments and predicables” of the schools as taught at Oxford;

¹See Locke's *De Arte Medica*.

²In dedicating his *Methodus Curandi Febres* to Mapleton, Sydenham wrote, “you know how thoroughly my method is approved of by an intimate and common friend of ours, and one who has closely and exhaustively examined the subject—I mean Mr. John Locke; a man whom, in the acuteness of his intellect, in the steadiness of his judgment, in the simplicity, that is, in the excellence of his manners, I confidently declare to have, amongst the men of our own time, few equals and no superior.”

and later declared that "the Galenists' sour humours, or the chymists' sal, sulphur, and mercury, or the late prevailing invention of acid and alkali, or whatever hereafter shall be substituted to these with new applause, will upon examination be found to be but so many learned empty sounds, with no precise determinate signification."¹ He writes to Thomas Molyneux,² "I hope the age has many who will follow his [Sydenham's] example, and, by the way of accurate practical observation, which he has so happily begun, enlarge the history of diseases, and improve the art of physic, and not, by speculative hypotheses, fill the world with useless though pleasing visions." "Nicely to observe the history of diseases in all their changes and circumstances is a work of time, accurateness, attention, and judgment, and wherein, if men through prepossession or obstinacy mistake, they may be convinced of their error by unerring nature and matter of fact . . . Upon such grounds as on the established history of diseases hypotheses might with less danger be erected. . . What we know of the works of nature, especially in the constitution of health and the operations of our own bodies, is only by the sensible effects, but not by any certainty we can have of the tools she uses or the ways she works by; so that there is nothing left for a physician to do but to observe well, and so, by analogy argue to like cases, and thence make to himself rules of practice."³ In the *Epistle to the Reader* of the *Essay* he says, "[Knowledge] had been very much more advanced in the world, if the endeavours of ingenious and industrious men had not been much cumbered with the learned but frivolous use of uncouth, affected or unintelligible terms, introduced into the sciences, and there made an art of, to that degree that philosophy, which is nothing but the true knowledge of things, was thought unfit or incapable to be brought into well-bred company and polite conversation. Vague and insignificant forms of speech, and

¹Locke to Thos. Molyneux, Jan. 20, 1692-3.

²Nov. 1, 1692.

³Locke to Thos. Molyneux, Jan. 20, 1692-3.

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abuse of language, have so long passed for mysteries of science . . .”¹

Locke and Boyle

Boyle directed Locke's early observations and experiments in physics, chemistry, and medicine. To him Locke reported such results of his many investigations while on the continent, as were important for the new science. Boyle gathered the members of the Royal Society around him when they had been driven from London to Oxford for political reasons. And of these Locke was one who, in less than ten weeks after his election to a body of over two hundred, was chosen one of a special committee of eleven “for considering and directing experiments.” At the request of “the very ingenious and learned Dr. J. L.,”² Boyle undertook his *Memoirs for the Natural History of the Human Blood*. In October of 1679 Locke, at Nicolas Thoynard's request, induced Boyle and others of the Royal Society to make observations on Jupiter and “his hosts,” remarking, “I suppose that Jupiter has ordered all his hosts to conceal themselves lest they should become too well known to mortals. . . . Bacon was banished because he knew a little mathematics, by no means so bold or monstrous as a resolution to spy out the secrets of the great king of heaven.” To Locke fell the privilege of editing certain of Boyle's papers in Boyle's *General History of the Air*.

This relationship of Boyle and Locke is very important for the interpretation of *An Essay concerning Human Understanding*, not only because of a common “historical” method, but because in 1665 (the *Essay* was begun in 1670 or 1671) there was brought out by Boyle a treatise on *The Origin of Forms and Qualities According to the Corpuscular Philosophy*. This contains a large part of the *Essay* and is expounded by means of the illustrations frequently found in Locke, e.g., the watch, sun, wax, gold soluble in *aqua regia*, etc. In Boyle's work we find the same account as Locke

¹P. 14, Fraser edition.

²See H. R. Fox Bourne, *The Life of John Locke*, v. I., p. 456.

has given of substances, qualities, powers, sensations; also the same relative naturalistic functionalism. We may, therefore, infer that these were common property in Boyle's set, certainly common to Boyle and Locke. What is distinctive of Locke is his advance beyond this, that is, an attempt at an epistemology rather than a physics of the universe. (In Locke, Boyle's theories of physics are modified in one detail by employing the idea of particles in motion to explain the action of the nerves and the brain. This is probably taken from Gassendi. In the *Author's Discourse to the Reader*¹ of the treatise of 1665 Boyle records, "[I] might have been more [benefited] by the learned *Gassendus's* little, but ingenious, *Syntagma Philosophiae Epicuri*, if I had more seasonably been acquainted with it."² Gassendi's exposition of Epicurus was widely read. Locke engaged in discussion with Bernier in the year 1677, and at that time the latter was engaged in preparing an abridgement of Gassendi's works, and the former was working on his *Essay*.)³

Boyle's Purpose and Method

Boyle's avowed purpose is a solution of the logical mysteries of substance, accident, entity, quality, through the hypothesis of "the mechanical affections of matter," and his method will be a verification of this from "experimental history." He writes:

"That then which I chiefly aim at, is to make it probable to you by experiments (which I think hath not yet been done) that almost all sorts of qualities, most of which have been by the schools either left unexplicated, or generally referred to I know not what incomprehensible substantial forms, may be produced mechanically; I mean by such corporeal agents, as do not appear either to work otherwise than by virtue of the motion, size, figure, and contrivance of their

¹Of the references which follow, those to Boyle are taken from vol. III., of the six-volume edition of his works, London, 1777; those to Locke, from Fraser's edition of the *Essay concerning Human Understanding*, unless otherwise specified.

²P. 9.

³*Journal*, Aug. 28.

own parts (which attributes I call the mechanical affections of matter, because to them men willingly refer the various operations of mechanical engines): or to produce the new qualities exhibited by those bodies, their action changes by any other way, than by changing the texture or motion, or some other mechanical affection of the body wrought upon."¹

"Those arguments that are wont to be employed by the schools to evince their substantial forms . . . one or two excepted . . . are rather metaphysical or logical, than grounded upon the principles and phenomena of nature, and respect rather words than things . . ."² "These . . . all . . . may . . . be sufficiently solved by the answers we have given to these, or at least by the grounds upon which those answers are built."³

Boyle's System

1. The primary or real qualities of substances are "matter, motion (or rest), bulk, and shape."⁴ These "are simpler and more primitive affections of matter, from which these secondary qualities, if I may so call them, do depend."⁵

2. Secondary or sense qualities. These secondary sense qualities are produced "by virtue of a certain congruity or incongruity in point of figure (or texture or other mechanical attributes) to our sensories, the portions or matter they modify are enabled to produce various effects, upon whose account we make bodies to be endowed with qualities."⁶

3. These secondary qualities are not in the body, they are the product of the interaction of the external body and the sensory organ.⁷

4. Powers. All qualities are powers which "proceed from the bare texture and other mechanical affections of [the body's] matter." They are relative to "the condition of the other bodies that are concerned in the operation."

¹P. 13.

²P. 40.

³P. 41

⁴P. 22.

⁵Pp. 23-4.

⁶P. 18.

⁷*Ibid.*

For example, "the sun hath a power to harden clay, and soften wax . . ."¹

5. Substances are relative in their activities. Change, creation, destruction are but modifications of matter through motion, and not *de novo* creations.²

6. Relative functionalism. All qualities and efficacies of bodies depend upon the activities of different bodies in their relative functioning. For example, "in a key . . . if its shape were incongruous to that of the cavity of the lock, it would be unfit to be used as a key though it were put into motion; yet, let its bigness and figure be never so fit, unless actual motion intervene, it will never lock or unlock anything as without the like actual motion, neither a knife nor razor will actually cut . . ."³

7. Different qualities denote the objects in different circumstances. Neither different names nor different definitions necessarily presuppose different entities, and may denote the same entity in "different capacities, or relations." For example, "in those other cases wherein a man that is a father, a husband, a master, a prince, &c., may have a peculiar definition (such as the nature of the thing will bear) belong unto him in each of these capacities; and yet the man in himself considered is but the same man, who, in respect of differing capacities, or relations to other things, is called by differing names, and described by various definitions."⁴

8. The permanent status of secondary qualities. There arises "a difficulty . . . and it is this, that whereas we explicate colours, odours, and the like sensible qualities by a relation to our senses, it seems evident that they have an absolute being irrelative to us: for snow (for instance) would be white, and a glowing coal would . . . thaw ice into water, although all the men and sensitive beings in the world were annihilated."⁵

¹Pp. 20-1.

²Pp. 19 and 36.

³Pp. 15-6.

⁴P. 17.

⁵P. 23.

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(Two contrasting solutions of this difficulty have been offered, one by Boyle, the other by Berkeley: the former based on "the mechanical affections of matter," the latter on ideas and spirits. Locke's is distinct from both and more complicated than either. Locke's microscopic observations, diagnoses of diseases, experiments in physics and chemistry, his respect for mathematics, contribute a problem to the *Essay* (see II, 8, 15-21). He draws inferences not from the pain, colour, figures of the "plain man," but from the motion and particles of the physicist in the fire, air, nerve, gut, and the figures of the mathematician. His proffered solution approaches uncritical naturalism more nearly than crude realism, and escapes both. The problem becomes that of the adequacy of scientific hypotheses for an interpretation of scientific categories.)

Boyle propounds a metaphysic borrowed from physics. He posits the primary qualities of matter, and employs the hypotheses of physics to cover all things (except the soul). Things act according to their capacities in certain manners, in certain circumstances; these capacities, manners, circumstances are covered by the hypothesis of the primary qualities of matter. The objects function in relations between themselves and in the perceptual relation between the object and the sensory organ; the perceptual relation is one among others. "We must not . . . look upon the universe that surrounds us as upon a moveless and undistinguished heap of matter, but as upon a great engine . . . the actions of particular bodies upon one another must not be barely estimated, as if two portions of matter of their bulk and figure were placed in some imaginary space beyond the world, but as being situate in the world, constituted as it now is, and consequently as having in their action upon each other liable to be promoted or hindered or modified by the actions of other bodies besides them . . . in agitating water into froth, the whiteness would never be produced by that motion, were it not that the sun or other lucid body shining upon that aggregate of small bubbles enables them

to reflect confusedly great store of little and as it were contiguous lucid images to the eye. . . .

"I do not deny but that bodies may be said in a very favourable sense to have those qualities we call sensible, though there were no animals in the world: for a body in that case may differ from those bodies which are now quite devoid of quality, in its having such a disposition of its constituent corpuscles, that in case it were duly applied to the sensory of an animal, it would produce such a sensible quality which a body of another texture would not: as though if there were no animals there would be no such thing as pain, yet a pin may, upon the account of its figure, be fitted to cause pain, in case it were moved against a man's finger; whereas a bullet, or other blunt body moved against it with no greater force, will not cause any such perception of pain."¹

Locke and Boyle's Naturalism

All this doctrine of Boyle Locke adopts, viz., the "matter and motion" metaphysics of nature, the primary and secondary qualities of bodies, powers, theory of sense perception, the relativity of perceived qualities through the action of real or primary qualities on the sensory, the naturalistic functionalism.

The advance which Locke makes beyond this system of naturalism constitutes his epistemology proper. This advance is constituted by these discoveries: (1) Perceived qualities are contingent upon consciousness. (2) Consciousness is not only actively creative, but also formally determinative. (3) For Locke as naturalist all things including minds act upon one another through cause and effect (active and passive powers); all elements are potentially functions. There comes a break, however, in this cosmic activity; for, after the activity of the element called understanding, there enters the object of thought, the "idea" which is fixed. This has no power of initiating or conducting "motion" like "things"; it does not function either as active or passive

¹P. 24.

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power; it connotes activity, but it is not itself activity; it is our interpretation of the way things behave. (4) The discovery of the principle of causality is made through the percipient's consciousness of his action. Those concepts used in explanation of the active subject are transferred to objects. (5) The universe of things in congruous action becomes in Locke, a cosmos of interrelated nominal essences which constitute our determinate mental world. What things in themselves really are we do not know; they are hidden behind the powers which they display in action. (6) No hypothesis can ever be adequate to the subject-matter; the best we can formulate is no more than a rule for convenience in practice. (7) Naturalistic functionalism passes from the uncritical stage to that of avowed methodological elements. The insuperable difficulty is to find elements which may through definition be adequate to the task of investigation. Locke is under the sway of chemistry rather than biology, and so does not employ, as a universal solvent, "nascent behaviour." He cannot escape the representative character of a structural functionalism, and any other would be reduced to futility.

Locke's Method

Locke intends "to take a survey of our own understandings, examine our own powers, and see to what things they are adapted."¹ This he will do through the employment of an "historical, plain method."

By "historical" he means the method of careful, accurate observation of the sequences of "matter of fact." Similarly, in Boyle's treatise on *The Origin of Forms and Qualities*, "the historical part,"² in contrast to "the theoretical part,"³ contains the observations of experiments. Locke turns away from "speculative hypotheses" and undertakes an examination of the mind and its objects in knowledge;

¹Introduction to the Essay, §7.

²P. 66.

³P. 14.

through observation, he attempts to "erect" hypotheses concerning "unerring nature."

His intention "to take a survey of our own understandings, examine our powers," does not include the impossible task of which Hegel accused Kant, or the Kantian question of the presupposed elements of meaning in experience; his statement implies merely an examination of an object in order to discover the nature of its elements which enter into certain observed activities. "Power" in Locke means but a capacity of a thing to act or to be acted upon in some manner. Moreover, our "narrow, weak faculties can reach no farther than the observation and memory of some few effects produced by visible and external causes . . ." By means of a careful "survey of our own understandings" we may see what they are and how they act.

In prosecuting this design he may regard his subject-matter altogether from the uncritical, naturalistic standpoint, and trace the activities which he regards as the way of knowledge (and its objects). He will then have certain elements which enter into compositions, and all such elements will be merely so many actors which contribute to the production of the observed data or states. In the Essay we may follow up the use of such a method and obtain a view of substances, embracing their existence and entrance into knowledge, as follows: Substances are external, solid bodies made up of corpuscles in motion and possessing also figure and bulk; these, which are the primary qualities of any body, possess powers to affect the primary qualities in others, and to produce secondary qualities which are those effects introduced by the activities of the object upon the sense organs. External physical bodies act upon the different sense organs and produce motion in the nerves, by means of which "impressions" are made on the brain. The "impressions" which are thus "suggested" through the surface sense organs and nerve tissues, the understanding acts upon and converts into "simple ideas of sensation;" these in turn, it compounds into "complex ideas," among which is that of substance. The physical object acts, the nervous system acts, the understanding acts.

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There is an additional turn which his method may take. He may employ a method of careful observation in seeking the postulates and categories with reference to which the act of knowing may be expounded. He will accept the physicist's account of substance, but not his definition of the substance category; he will accept the hypotheses of the new sciences as the most fruitful, but not judge them merely by their results. He will recognize the action of elements, but as action which is determined in context through organization by an investigator. His "historical, plain method" may be transformed if he turns to investigate not only the source and nature of the ideas through processes which involve such fundamental categories as cause and effect, substance, action, but also the sources and natures of these categories themselves. Both of the above courses are followed throughout the *Essay*; the latter is the one held to in the end; it produces those results in which Locke advances beyond Boyle.

Locke's Problem

In approaching Locke's problem, let us look first at two obstacles in the way to a solution, and thus learn how we may proceed. Adamson writes, "(it is the very essence of Locke's method to identify a simple impression of sense with the knowledge of a simple sense fact). The processes of abstraction, comparison, *i.e.*, judging and reasoning, were exercised upon their data, and these products were, in consequence, of a secondary and, so to speak, artificial character."¹

Of Locke, Windelband says, "In principle he placed sensation and reflection upon an equality psychologically, and in his genetic theory even made the latter dependent upon the former. But in assigning the epistemological values this relation is at once reversed in the spirit of Cartesian principles. . . ."

"In connection with his theories of the idea of sensation, he adopts the doctrine of the intellectual nature of the

¹Article on Logic, §23., *Encyclopaedia Britannica*, 9th ed.

sense qualities, [and also suffers] a decided relapse into the mode of thought of Democritus and Epicurus."¹

On the surface these statements may not appear to fit, yet both may be justly applied to Locke. One reveals the impediment in the way of his naturalistic functionalism; the other presents the difficulty which Locke himself recognized, in his results which go beyond Boyle's system.

Locke proposes his notion of action and reaction, which covers the factor of sensation, and then holds besides his several elements (which include the understanding and work causally together) the doctrine of the "idea" which will not act. He thus introduces an "artificial" break in his naturalistic functionalism. He holds, moreover, that the "idea" not only does not act, but must be acted upon by the understanding in the making of "complex ideas." Hence the product of the mind is necessarily "secondary" and doubly "artificial."

The difficulty mentioned by Windelband arises when Locke, in attempting to account for the least experience or "simple idea," begins with the external object as defined by physics (not with the definition of physics), and seeks to work inward to the mind. This difficulty is never solved; it is after a fashion, transcended by an epistemology which ignores it.

The objection of Adamson does not apply to Locke's conscious epistemology, for here, (a) "knowledge of a simple sense fact" requires at least that the "simple impression of sense" is "clear" or "determined;" this is possible only through objectification in meaning by thought; (b) that which "reasons" is the percipient in "the idea of sensation," conscious, determinative; (c) sense qualities are of an intellectual nature.

Physics and the "Simple Idea"

Three explicit statements of the doctrine of physics are to be found in *Essay*, II. 8. 4; II. 8. 12.-22; and II. 9. 3.-4. A

¹*History of Philosophy*, tr. Tufts, pp. 467-8.

Regarding these we must note carefully that, (a) while he accepts the physicist's definition of substance, he distinguishes between "physical speculations" and a theory of knowledge (II. 8. 4.; II. 8. 22.; Intr. §2.; abstract of the *Essay* trans. by Le Clerc and published in the *Bibliothèque Universelle* of 1688, lib. II., chap. 7.); (b) he professes to begin with "ideas of sensation," and not with the physical motions leading up to them,¹ and states that a physiological reaction is never an idea (II. 9. 4.; III. 4. 10.); (c) he can give no account of how particles in motion can enter into the production of ideas. In stating this he wavers² from "I will not here determine" (II. 8. 4.-6.) to an acknowledgment of ignorance (IV. 3. 28.).

All the difficulties are created by what Windelband calls, "the intellectual nature of the sense qualities" or simple ideas. The least experience is composed of "simple ideas of sensation," and the distinctive feature of ideas is that they are not states in causal process but are meanings, fixed objectively for and by the understanding. All the elements act, the external object, the sense organs, the nerve tissue, the brain, the understanding, and then lo! the "object of the mind," which has no power to initiate or conduct "motion," and does not function as active or passive power. The functional process through cause and effect is broken. The idea which stands objectified in meaning may change, or more definitely be changed in consciousness by thinking, but only to be fixed further. It always has a definite context, and in this sense is never simple but denotes a power which produces a certain effect in certain circumstances. The naturalistic theory of substances and qualities had failed to take into account the fact that qualification of the object comes from a consciousness for which it has meaning; the explanation of corpuscles in motion is an hypothesis for the interpreter; and causality, which seemed to explain all things, needs to be investigated itself. The physicist's definition of substance determined the inquiry and did not

¹References in (a).

²See II. 8. 13.

lead to a solution. Therefore, in order to advance Locke must discover a different, an epistemological definition of substance. We shall now trace the development of these conclusions.

The Understanding in the "Idea of Sensation"

Locke makes use of several metaphors to represent the mind, "white paper, void of all characters,"¹ brass and marble tablets,² storehouse,³ empty cabinet,⁴ surface for footsteps . . . All of these suggest mere passivity on the part of the understanding. And there are further statements which seem to indicate the same: (a) ". . . the understanding can no more refuse to have . . ." ⁵ (b) ". . . the mind is forced to receive the impressions . . .," ⁶ (c) ". . . those ideas in the reception whereof the mind is only passive . . . are those simple ones received from sensation and reflection before mentioned . . ." ⁷

While these expressions are used, those figures and passages in which the symptoms of mere passivity are indicated provide evidence against it. White paper, brass or marble tablet, empty cabinet, all possess capacities; as elements they can only be relatively passive; they are "void of all characters," but not of all positive characteristics. In the passage from which (a) and (b) are taken, a discrimination is made between "offered to the mind" and "imprinted;" between "obtrude their particular ideas upon our minds" and "some obscure notions of them [by] the operations of our minds;" between "receive the impressions" and "the perception of these ideas that are annexed to them." Again, Locke writes, "that which uses to produce the idea, though conveyed in by the usual organ, not being taken notice of in the understanding, and so imprinting no idea in the mind, there follows no sensation. So that wherever there is sense or perception, there some idea is actually produced, and

¹II. 1. 2.

²II. 10. 5.

³II. 10. 2.

⁴I. 1. 15.

⁵II. 1. 25.

⁶*Ibid.*

⁷II. 12. 1.

present in the understanding."¹ In the passage from which (c) is taken the "mind" or "understanding," (II. 1. 24. and 25.) is said to be "passive." Passivity here cannot exclude activity on the part of the understanding for both ideas of sensation and reflection are included, and an idea of reflection is got thus, "the mind comes to reflect on its own operations . . . and thereby stores itself with a new set of ideas."² If these passages seem equivocal, there are many others which admit of no double interpretation. "Whatever idea was never *perceived* by the mind was never in the mind. Whatever idea is in the mind, is, either an actual perception, or else, having been an actual perception is so in the mind that, by the memory, it can be made an actual perception again."³ Now by the memory no impression from the "brisk acting of some objects without" is made.⁴ Therefore, an "actual perception" in so far as it exists for the percipient, is not mere sense impression; it is a product of the understanding. This retains it in memory and reproduces it at will.⁵

"Whatever be the external cause of [the simple idea of sensation,] 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."⁶

"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, &c., 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."⁷

¹II. 9. 4.

²II. 1. 24.

³I. 3. 21.

⁴IV. 11. 5.

⁵IV. 11. 5.

⁶II. 8. 1.

⁷II. 23. 15.

"I take the liberty to observe, that if your lordship allows brutes to have sensation, it will follow, either that God can and doth give to some parcels of matter a power of perception and thinking; or that animals have immaterial, and consequently according to your lordship, immortal souls as well as men: and to say that fleas and mites, &c., have immortal souls as well as men, will possibly be looked on as going a great way to serve an hypothesis . . ." ¹ "That which puts the distinction betwixt the animal kingdom and the inferior parts of nature [is the] faculty of perception."² "In vegetables, the altering of their figures and motions . . . is all bare *mechanism*; and no otherwise produced than the turning of a wild oat-beard, by the insinuation of the particles of moisture, or the shortening of a rope by the affusion of water. All which is done without any sensation in the subject, or the having or receiving any ideas."³ "Sensation in the subject, or the having or receiving an idea" is not the product of "figures and motions" of particles; it is beyond "bare mechanism."

The Conscious Mind and its "Immediate Objects"

And there is no break between the understanding which is active in their formation, and ideas which are fixities and which are changed to fixities. Ideas are not only products, but "immediate objects" of the understanding; they have neither meaning nor existence apart from the understanding, and they constitute a necessary element in any conscious activity. Locke protests against that interpretation of his Essay which would make contrasted function, distinct status, and emphasis imply opposition among his elements explanatory of conscious process. He writes to Stillingfleet, "My *new ways by ideas*, or *my way by ideas* . . . may, in the full latitude, comprehend my whole Essay: because, treating in it of the understanding, which is nothing but the faculty of thinking, I could not well treat of that faculty of the mind,

¹Third letter to Stillingfleet.

²II. 9. 11.

³II. 9. 11.

which consists in thinking, without considering the immediate objects of the mind in thinking, which I call *ideas*: and therefore, in treating of the understanding, I guess it will not be thought strange, that the greatest part of my book has been taken up, in considering what these objects of the mind, in thinking, are; whence they come; what use the mind makes of them, in its several ways of thinking; and what are the outward marks whereby it signifies them to others, or records them for its own use."¹

"Your lordship indeed here again seems to oppose reason and ideas . . .

". . . if we will employ our minds, and exercise our reason, to bring us to certainty; what I beseech you, shall we be employed about but ideas? For ideas, in my sense of the word, are, 'whatsoever is the object of the understanding, when a man thinks; or whatever it is the mind can be employed about in thinking' . . . So that my way of ideas, and of coming to certainty by them, is to employ our minds in thinking upon something; and I do not see but your lordship yourself, and everybody else, must make use of my way of ideas, unless they can find out a way that will bring them to certainty, by thinking on nothing."²

"Consciousness is the perception of what passes in a man's own mind."³ "To find wherein personal identity consists, we must consider what person stands for;—which, I think, is a thinking, intelligent being, that has reason and reflection, and can consider itself as itself, the same thinking thing, in different times and places; which it does only by that consciousness which is inseparable from thinking, and, as it seems to me, essential to it: it being impossible for any one to perceive without *perceiving* that he does perceive. When we see, hear, smell, taste, feel, meditate, or will anything, we know that we do so. Thus it is always as to our present sensations and perceptions: and by this every one is to him-

¹Second letter.

²First letter.

³II. 1. 19.

self that which he calls *self*.”¹ It is the same conscious understanding which constitutes personal identity, which sees and hears, feels and meditates. “Knowledge of a simple sense fact,” the awareness of a sound or odour is not a “simple impression,” but the “immediate object” of productive conscious thought. Moreover, it is always determined into a context, for “knowledge of a simple sense fact” has its place in thought, derives all that it is, from denoting at least the mutual working of an active and passive power.

We shall now consider the nature of the “simple idea,”—as a part of knowledge, and then trace the complex idea “substance” from its status as corpuscles in motion to epistemological element.

The “Simple Idea”

The main evidence against the arbitrary character of the judgment is an emphasis on the fact that the simple idea always possesses characteristics which are those of the predicate in the judgment; it is that qualification by which the object is idea-ed or idea-ly determined to be such and such; it is that which is affirmed as definite and predictable knowledge regarding the object to which it is applied; it is not, as we shall see, divorced from the concept or from the “something” in which the sense qualities inhere.

The simple idea is a quality of the object.² A “clear” idea of sensation is an idea “determined,” “objectively in the mind,” “without variation determined . . . that very same object of the mind.”³ The determined idea is a named idea, and the determined, named idea is an abstract idea.⁴ The abstract idea is general,⁵ so that “to talk of specific differences in nature, without reference to general ideas in names, is to talk unintelligibly.”⁶ Thought is possible only through the

¹II. 27. 11., (see II. 23. 15.).

²II. 21. 1.-2.; II. 2. 1.; II. 23. 1. and 4.

³*Epistle to the Reader*, p. 22.

⁴II. 11. 9.-10.

⁵III. 1. 3.; III. 1. 6.

⁶III. 6. 5.

abstraction of general ideas.¹ That which has a name is not "impression" but a fixed, general objectification in meaning. All determinations of the object in the perceived sense qualities are not only general but relative, the simple sense quality considered relatively is an active or passive power, it denotes action of something in context. "Put a piece of gold anywhere by itself, separate from the reach and influence of all other bodies, it will immediately lose all its colour and weight . . ."²

Cause and Effect: Power

Locke declares that "the most comprehensive relation, wherein all things do or can exist, are concerned, is the relation of cause and effect." Causality may be analysed into active and passive powers. "The mind . . . concluding from what it has so constantly observed to have been, that the like changes will for the future be made in the same things, by like agents, and by the like ways,—considers in one thing the possibility of having any of its simple ideas changed, and in another the possibility of making that change; and so comes by that idea which we call power. Thus, we say, Fire has a power to melt gold . . . and gold has a power to be melted; that the sun has a power to blanch wax, and wax a power to be blanched by the sun . . . Power thus considered is two-fold, viz. as able to make, or able to receive any change. The one may be called active, and the other passive power."³

Again, "sensible qualities, as colours and smells, &c., [are] the powers of different bodies, in relation to our perception, &c."⁴

Faculties are powers of the mind;⁵ perception,⁶ contemplation, memory,⁷ discerning, comparing, compounding, naming, abstracting,⁸ willing⁹ are examples.

¹II. 11. 10.

²IV. 6. 11.

³II. 21. 1.-2.

⁴II. 21. 3.

⁵II. 21. 6.

⁶II. 9. 1.; II. 21. 5.

⁷II. 10. 1.-2.

⁸II. 11. 1.-9.

⁹II. 21. 5.

Sensible qualities are relative to one another through the activities of those objects which influence one another.¹

The Notion of Cause and Effect: Its Source

Locke's doctrine is not in line with that modern theory which regards causality as a principle of serial continuity. He holds the "spiritualistic explanation . . . where the scientific analysis is incomplete." Locke is under the domination of the chemistry of the seventeenth century rather than contemporary mathematics, or the biology of the twentieth century. Hence, instead of serial order he stresses active elements, and instead of nascent behaviour, working agents.

Causality, he says, consists in "the passing of motion out of one body into another."² The source of the conception is the agent's consciousness of his action or forbearance to act. A cause is an individual, active in the production of "new motion." Those concepts which he finds necessary to explain the self are applied to the objects. The categories of the subjective become the qualifiers of the objective; the uncontroverted externality which he merely described, becomes an objectivity interpreted through the faculties, apparatus, hypotheses of the investigator. Both bodily substances and spirits are unknowables within experience. "Two bodies, placed by one another at rest, will never afford us the idea of a power in the one to move the other but by a borrowed motion: whereas the mind every day affords us ideas of an active power of moving of bodies; and therefore, it is worth our consideration, whether active power be not the proper attribute of spirits, and passive power of matter . . . Pure spirit, viz. God, is only active; pure matter is only passive; those beings that are both active and passive, we may judge to partake of both."³ "The idea of the *beginning* of motion we have only from reflection on what passes in ourselves; where we find by experience, that, barely by willing it, barely

¹II. 21. 1.-2.; IV. 6. 11.

²II. 23. 28.

³II. 23. 28.

by a thought of the mind, we can move the parts of our bodies, which were before at rest. So that it seems to me, we have, from the observation of the operation of bodies by our senses, but a very imperfect obscure idea of *active* power; since they afford us not any idea in themselves of the power to begin any action, either motion or thought."¹ Locke makes no definite pronouncement on the necessary uniformity of different causes and different effects. He does not profess to know the real natures of the actors; as "real essences" they are hidden behind causes and effects as elements behind the hypothesis of the investigator. We have observed things to act in the same respective manners under certain conditions, and we expect them to do so. If one thing were to behave differently in relation to another from what we have observed, we should change its nominal essence,—that is, what we know about it.²

Substance and the Hypothesis of Physics

In giving an account of substance, Locke begins with the doctrine of the physicist concerning "the bulk, texture, and figure of the minute parts of bodies, on which their real constitutions and differences depend."³ His next step is the instancing of several theories of explanation,⁴ pressure of the particles of air, pressure of the aether, pressure of any ambient fluid, and deciding that "that pressure which is brought to explain the cohesion of bodies is as unintelligible as the cohesion itself."⁵ While the "corpuscularian hypothesis" is a better tenet than others, it is only an hypothesis, "that which is thought to go furthest in an intelligible explanation of those qualities of bodies; and I fear the weakness of human understanding is scarce able to substitute another . . ."⁶ Every hypothesis offered in explanation of "the substance of body" is inadequate; "we are as far from the idea of the substance of body as if we knew nothing at all."⁷

¹II. 21. 4.

²See II. 21. 1.; II. 23. 8.-9.; IV. 4. 4.; and discussion of Essences below.

³II. 23. 8.

⁴II. 23. 23.-4.

⁶IV. 3. 16.

⁵II. 23. 27.

⁷II. 23. 16.

The hypothesis *quâ* hypothesis must be examined in order to ascertain its soundness and degree of finality. Concerning those truths which we may discover by means of it, Locke instructs us as follows: We can have no certain knowledge of what we find.¹ We understand that which we construct to an end, only, however, in so far as it functions to a definite end of construction, *e.g.*, the watchmaker does not know the steel in the watch-spring while he understands the working of the watch.² The reliability of knowledge depends upon our faculties,³ the instrument used in experiment,⁴ the hypothesis employed.⁵ The end of knowledge is its usefulness in the common intercourse of "market and exchange," its fitness "for the neighbourhood of the bodies that surround us, and we have to do with."⁶ "He that was sharp-sighted enough to see the configuration of the minute particles of the spring of a clock . . . would no doubt discover something very admirable: but if eyes so framed could not view at once the hand, and the characters of the hour-plate, and thereby at a distance see what o'clock it was, their owner could not be much benefited by that acuteness; which, whilst it discovered the secret contrivance of the parts of the machine, made him lose its use."⁷

Substance and the Concept

The *Essay* contains such statements as, "Sensation convinces us that there are solid extended substances." These are too ambiguous for interpretation and therefore should not by themselves be employed to determine the doctrines of Locke. When under the domination of physics, he regards substance as a number of different sensational qualities from objects in which exist the powers to produce these qualities when the objects come into contact with the sense organs. "The ideas they produce in the mind enter by the senses simple and unmixed."⁸ Elsewhere the emphasis is changed

¹IV. 12. 10.

²IV. 3. 25.

³IV. 3. 24.-7.

⁴II. 23. 11.

⁵IV. 12. 12.-3.

⁶*Ibid.*; II. 23. 12.-3.

⁷II. 23. 12.

⁸II. 2. 1.

and laid on the observation and perception of something. Substances are said to be "*collections* of simple ideas as we have observed by our senses to be united together."¹ Again, the notion of substance is regarded as an expedient "made use of for quick dispatch," devised after observation of constancy of co-existence.² Again, when he remembers that between the physical object and the perception of it, between the subject-matter and the hypothesis concerning it, there is all the difference between moving matter and the interpretation of data to be defined, he defines substance as a "supposed" something besides the qualities and in which they inhere. "Substance is supposed always something besides the extension, figure, solidity, motion, thinking, or other observable ideas, though we know not what it is."³

Finally, he tells us the physicist must use concepts; substance is that which is necessary "because we cannot *conceive* how qualities should subsist by themselves." From a jumble of atoms, substance has been transformed into an essential concept or category of conscious experience. Thus "when we talk or think of any particular sort of corporeal substances, as horse, stone, &c., though the idea we have of either of them be but the complication or collection of those several simple ideas of sensible qualities, which we used to find united in the thing called horse or stone; yet, *because we cannot conceive how they should subsist alone, nor one in another*, we suppose them existing in and supported by some common subject; which support we denote by the name substance . . ."⁴ To Stillingfleet he writes: "Your lordship then . . . concludes that there is substance, 'because it is a repugnancy to our conceptions of things that modes or accidents should subsist by themselves;' and I conclude the same thing because we cannot conceive how sensible qualities should subsist by themselves."⁵

¹IV. 11. 9.

²II. 23. 1.

³II. 23. 28.

⁴II. 23. 4.

⁵Third letter.

The Complex Idea

The complex idea "substance" is a necessary concept in thought. It takes that place in thought which the subject has in the judgment, "because we cannot conceive how [qualities] should subsist alone, nor one in another." Locke writes to Stillingfleet, "I never said that the general idea of substance comes in by sensation and reflection; or, that it is a simple idea of sensation or reflection, though it be ultimately founded in them: for it is a complex idea, made up of the general idea of something, or being, with the relation of a support to accidents."¹ "When we speak of any sort of substance, we say it is a thing having such or such qualities; as body is a thing that is extended, figured, and capable of motion; a spirit, a thing capable of thinking; and so hardness, friability, and power to draw iron, we say, are qualities to be found in a loadstone."² The "simple ideas" which provide the "ingredients" of the complex idea, are its predicates when used as a subject, and are general and relative qualities. If X, Y, Z, be the possible subjects, then the only possible predicates are the general, common ones, a, b, c, d . . . The determined distinctions between X, Y, Z will consist in "the number and order" of these predicates. "Complex ideas, as they are made up of simple ones, so they are clear when the ideas that go to their composition are clear, and the number and order of those simple ideas that are the ingredients of any complex one is determinate and certain."³ There is "confusion" when we are not aware of a sufficient number of the qualities of the object, of their order, and especially of those qualities by which the object may be differentiated from similar objects. A complex idea is confounded with others when it "is made up of too small a number of simple ideas, and such only as are common to other things, whereby the differences that make it deserve a different name, are left out. Thus, he that has an idea made up of barely the

¹First letter.

²II. 23. 3.

³II. 29. 2.

simple ones of a beast with spots, has but a confused idea of a leopard; it not being thereby sufficiently distinguished from a lynx, and several other sorts of beasts that are spotted."¹

Nominal Essences

"Properties [belong] only to species and not to individuals.' The nominal essence is constituted by those ideas which we attribute as abstract qualities to different things of the same species or sort. The real essence is the "source of all those operations to be found in any individual of that sort."² Sorts are "such complex ideas wherein several particular substances do or might agree, by virtue of which they are capable of being comprehended in one common conception, and signified by one name. I say do or might agree: for though there be but one sun existing in the world, yet the idea of it being abstracted, so that more substances (if there were several) might agree in it, it is as much a sort as if there were as many suns as there are stars."³ Thus in the system of "nominal essences" the object is given its definite place in thought. "Take away the consideration of its being ranked under the name of some abstract idea, and then there is nothing really necessary to it, nothing inseparable from it."⁴ The nominal essence changes as the concept becomes more precise, more differentiated, more refined. This is exemplified in "gold" for the child and the scientific adult,⁵ in the clock for the layman and the watch-maker.⁶

Real Essences

Locke voices his agnosticism in respect to things-in-themselves thus: "If we suppose . . . that things existing are distinguished by nature into species, by real essences, according as we distinguish them into species by names, we shall be liable to great mistakes."⁷ Besides the nominal

¹II. 29. 7.

²III. 6. 3.

³III. 6. 1. and 7.

⁴III. 6. 6. and 4.

⁵III. 2. 3.

⁶III. 6. 3.

⁷III. 6. 13.

essences according to which things are ranked and related in thought, there are "real essences," what things really are, and not what we interpret them to be. "By this real essence I mean . . . that particular constitution which everything has within itself, without any relation to anything without it."¹ It is the "source of all those operations which are found in any individual of [any] sort."² Real essences are hidden behind their powers, and these powers are relative to other objects and to the organs of sense.

Substance

Locke begins with the account of the physicist and ends with that of the epistemologist. He becomes conscious of a need for hypotheses and concepts, and then regards substance as a necessary concept in conscious experience. Substance holds that place in thought which the subject holds in the judgment. All determinations of any object are general in meaning; nominal essences or what we know of one object and what we know of another, are made up of common predicates. Substances are individual actors which causally influence one another. They are sustainers of relations which are the interpretations of different substances through their relative actions and reactions. The known qualities of individual substances are their nominal essences which signify action in any given context; the determinations in the nominal essence are not distinct from its relations; these relations are internal to the nominal essence and "extrinsic" to the real essences. Substances are, therefore, not exhausted by their relations. All we know of substances is what they do; the agent is hidden behind its activities.³ The sum total known about it is its observed actions. A thing may have different essences, they depend on the point of view, previous knowledge, *e.g.*, the layman's and the watchmaker's observation of the clock. The

¹III. 6. 6.

²III. 6. 3.

³II. 23. 37.; IV. 6. 11.; III. 6. 9.

system of knowledge is a changing system, it is equivalent to the individual's mental adjustment to the world in which he lives. The only absolute knowledge is that of abstract ideas because here the predicates are exhaustive.¹

Locke's Categories

Locke introduces his scientific treatment of mind by refusing to admit any point of departure or source of information other than observed data in experience, and enunciates a logic of science based only on method. His method of analysis is after the fashion of the new chemistry which seeks to discover constitutive and unresolvable elements; through observation data will be resolved into their constitutive factors as in experiment the elements are extracted from a compound.

A physical fact is constituted by reactions, a known physical fact includes the additional reactions of the knowing mind. Through all activity there is a common factor, power active and passive, which provides a functional continuity. This one relation, causality, into which all things enter, provides Locke with his first main category.

The functional continuity of action and reaction is not all, however, for observation reveals one important factor, the idea, which does not act at all; it plays its part but is a sort of fixture. And all perceived ideas are general, they are relative in that they denote the common interactions of things; their significations are determined by their positions in an enlarging system of knowledge. Thus there is a second unity of scientific system which represents functional processes; it is ever changing, ever increasing to the aid of man, yet it is ever determined by the intellect. This system is representative and structural; it comprises "nominal essences" but not the sources of actions which are distinct individuals—witness ourselves.

While the "simple idea" represents some one activity of the object, and the "nominal essence" represents all the

¹IV. 6. 10.; IV. 4. 4.-6.

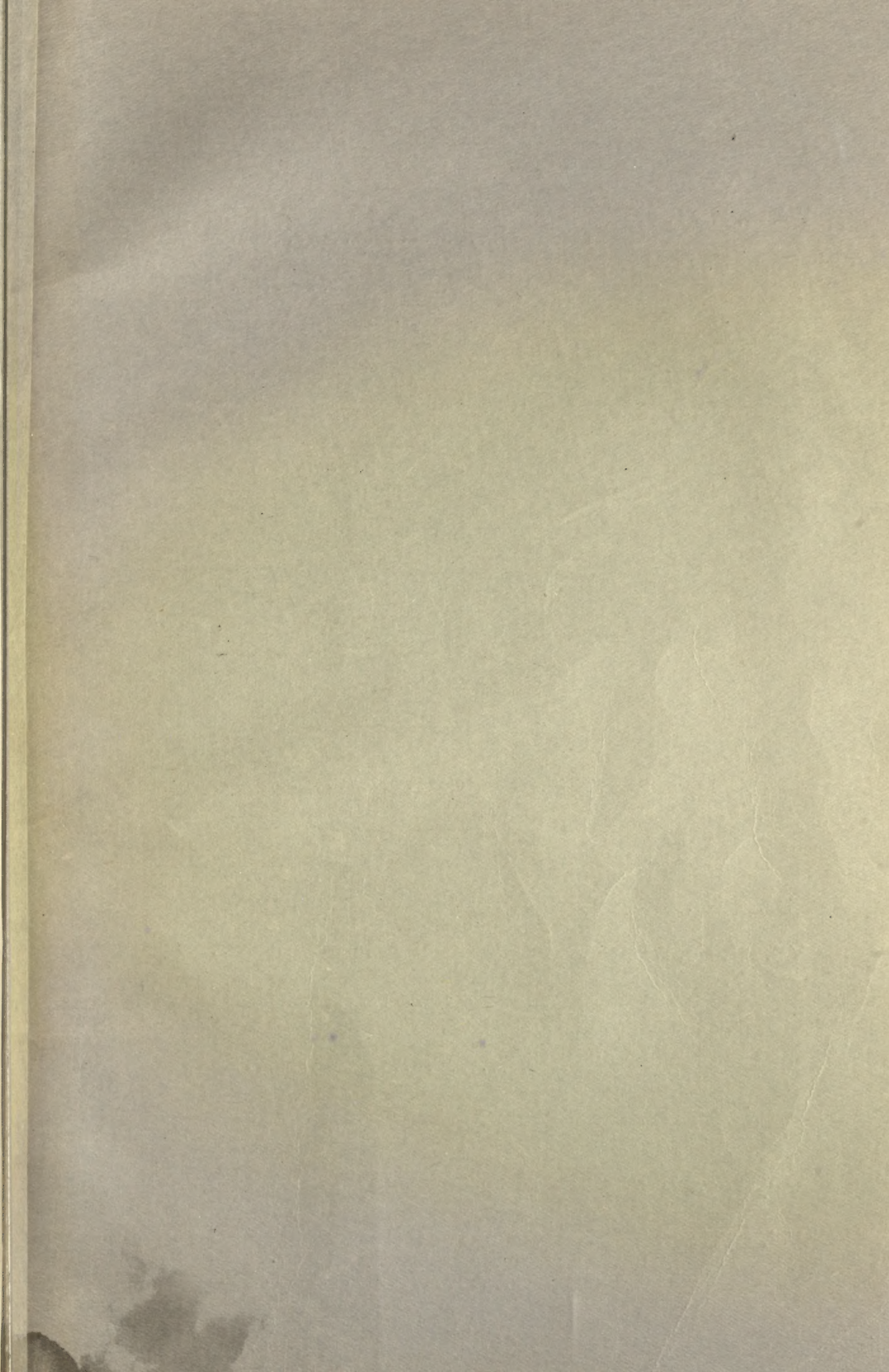
known activities of any object, the one main notion causality covers all the activities of every object. If we apply to this notion the method of observation, we are led to the conclusion that its source is the agent's consciousness of his own activity. The cause is an individual agent. Hence, we have a third main category, the real essence, or unknowable source, of the object's activities.

Thus Locke, who has come to the epistemological problem from the side of the external object as defined by science, free from the subjectiveness of "proud men," acknowledges that the main categories of knowledge are subjective in origin. He is not forced to capitulate his principles before any "logical" method which would find factors beyond experience; he is obliged, however, to admit a methodology built on more grounds than his "historical method."

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